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## A MONOGRAPH OF THE GENUS *BAPTISIA*<sup>1</sup>

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### INTRODUCTION

*Baptisia* is a perennial herbaceous member of the Leguminosae which has been variously treated in different taxonomic publications. Small, who treated the group most thoroughly, placed it in the tribe Podalyrieae of the Fabaceae. It was included within the Podalyrieae, a subdivision of the Papilionaceae, by Britton and Brown. Gray's "Manual" regards it as a member of the Papilionoideae, a sub-family of the Leguminosae.

The genus *Baptisia* is confined to the eastern half of North America, embracing the general area from Maine to Florida, west to Minnesota, and south to Texas. *Baptisia tinctoria* and *B. leucantha* have been reported from Ontario, *B. Nuttalliana* and *B. minor* from Mexico adjacent to Texas; but such reports are rare as the genus is essentially one of the United States. In number of species it is most abundant in the eastern and southeastern states. Westward from the coast the number in-

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<sup>1</sup> An investigation carried out in the Graduate Laboratory of the Henry Shaw School of Botany of Washington University and submitted as a thesis in partial fulfillment of the requirements for the degree of doctor of philosophy in the Henry Shaw School of Botany of Washington University.

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creases with the rising uplands and dwindles beyond the Appalachian range to fewer species but to a distinct group differing considerably from the extreme eastern and southeastern types. The genus is well represented throughout the Mississippi Valley, but there have been no collections west of the Rocky Mountains.

Taxonomically, the genus has gradually passed into a rather complicated state of affairs. The first species described were of the eastern states. As the country developed westward and more specimens were collected, attempts were made to fit them into the first descriptions. Frequently the plants in question were entirely new entities. In time the original descriptions were modified to include the newer types, and in a few instances the later collections outnumbered the earlier ones to such an extent that the true nature of the species as originally described was lost.

It was with the idea of straightening out as many of these problems as possible that the present investigation was undertaken. Herbarium material of the Missouri Botanical Garden constituted the principal basis for the study. In addition visits were made to Notre Dame University, the Field Museum of Natural History, the Gray Herbarium of Harvard University, the New York Botanical Garden, the Academy of Natural Sciences of Philadelphia, the United States National Museum, and the Charleston (S. C.) Museum, for the examination of type specimens and authentic material of the earlier species. Through the Missouri Botanical Garden loans were secured from twenty other American herbaria.

The examination of the above-mentioned material has resulted in a revised classification, the separation of several species into two or three categories, and the recognition of six new species, eight new varieties, and one new form. The discovery of eight clear-cut cases of hybridism, and a few additional suspected ones, contributed immeasurably to the solution of many problems. Species for which insufficient data are available have been relegated to a list of doubtful species.

Sincere appreciation is expressed to Dr. J. M. Greenman, Curator of the Herbarium of the Missouri Botanical Garden,

who suggested the problem and under whose guidance the work has progressed; and to Dr. George T. Moore, Director of the Missouri Botanical Garden, for the privileges afforded in the use of the library and herbarium. Thanks are due also to those in charge of the herbaria of those institutions whose specimens were made available; and to those in charge of the following institutions for the loans of books and photographic copies of references: Gray Herbarium of Harvard University, United States Department of Agriculture Library, and Muséum d'Histoire Naturelle. The author is extremely grateful to all who made special collections in the southeastern states and to temporarily inaccessible regions during the course of this investigation. Without this willing assistance the solution of many problems would have been impossible.

#### TAXONOMIC HISTORY OF THE GENUS

Under the generic names of *Crotalaria* and *Sophora* Linnaeus published four species which have been absorbed by *Baptisia*. These are: *Crotalaria alba* and *C. perfoliata*,<sup>1</sup> and *Sophora tinctoria*, 1753,<sup>2</sup> and *S. australis* 1784.<sup>3</sup> In 1788 Walter<sup>4</sup> added two more under *Sophora*, namely *S. lanceolata* and *S. villosa*. *Sophora australis* was transferred to *Podalyria* by Willdenow<sup>5</sup> in 1799; and in 1803 Michaux<sup>6</sup> placed the other five in *Podalyria*, treating *S. lanceolata* Walt. as a synonym of *P. uniflora* Michx.

Ventenat<sup>7</sup> founded the genus *Baptisia* in 1808, basing his description on *Sophora alba* L. and *S. tinctoria* L. These two species were cited by him but were not accompanied by specific descriptions.

In 1811 Robert Brown<sup>8</sup> recognized *Baptisia* as a valid genus

<sup>1</sup> Linn. Sp. Pl. 2: 716, 714. 1753.

<sup>2</sup> Linn. Sp. Pl. 1: 373. 1753.

<sup>3</sup> Linn. Syst. Veg., ed. 14, 391. 1784.

<sup>4</sup> Walt. Fl. Car. 134, 135. 1788.

<sup>5</sup> Willd. in Linn. Sp. Pl., ed. 4, 2: 503. 1799.

<sup>6</sup> Michx. Fl. Bor. Am. 1: 263-265. 1803.

<sup>7</sup> Vent. Dec. Gen. Nov. 9. 1808.

<sup>8</sup> R. Br. in Ait. Hort. Kew., ed. 2, 3: 5, 6. 1811.

and referred thereto *B. alba*, *B. tinctoria*, *B. australis*, and *B. perfoliata*, giving a complete description of each species.

Nuttall<sup>9</sup>, in 1818, treated *Baptisia* as a valid genus indigenous to North America, listed eight species, and added a new one, *B. leucophaea*. His *B. caerulea* is synonymous with *B. australis*, and *B. mollis* has since been transferred to *Thermopsis*. In 1821 Elliott<sup>10</sup> described *B. uniflora* Nutt. more fully as *B. lanceolata* and this specific name has stood since then. At the same time he described a new species, *Baptisia bracteata*, based on *Podalyria bracteata* Muhl.

*Crotalopsis* Michx. was designated as a generic synonym of *Baptisia* by DeCandolle<sup>11</sup> in 1825.

In 1837 Rafinesque<sup>12</sup> proposed four generic names—*Eaplosia*, *Lasinia*, *Pericaulon*, and *Ripasia*—for different entities of *Baptisia*, adding a few new specific descriptions. Neither the generic nor specific names have ever been recognized as anything but synonyms of *Baptisia*.

Torrey and Gray<sup>13</sup> described a new species, *B. leucantha*, in 1840, which is one of the dominant members of the group, having a distribution from Ontario to Minnesota, south to Louisiana and Texas.

From time to time several other new species have been described, most of them more or less localized in rather small areas; but no attempt will be made to go into a detailed account of their history. The species noted above are the typical representatives of the group; and, except for a few isolated species of doubtful status, they are the ones about which the greatest confusion has existed.

#### GENERAL DISCUSSION OF PROBLEMS AND CONCLUSIONS

1. *Baptisia australis*-*B. minor* complex: *B. australis* has for many years been the classical "dumping ground" for material collected in the Middle West. There can be little doubt as to the

<sup>9</sup> Nutt. Gen. N. Am. Pl. 1: 281, 282. 1818.

<sup>10</sup> Ell. Sketch Bot. S. Car. & Ga. 1: 467, 469. 1821.

<sup>11</sup> DC. Prodr. 2: 100. 1825.

<sup>12</sup> Raf. New Fl. N. Am. 2: 47-52. 1836 [1837].

<sup>13</sup> Torr. & Gray, Fl. N. Am. 1: 385. 1840.



true nature of *B. australis* because for no other species is there such a wealth of literature, copiously illustrated. As originally described, it is a beautiful blue-flowered, large-leaved, simple- and erect-branched species of the eastern states and responds very well to cultivation. Early in the nineteenth century it was introduced into European gardens, especially in England and France. This fact, incidentally, paved the way for a number of problems in synonymy as it was given a number of new names abroad. A comparison of illustrations and descriptions, however, leaves no question as to their identity.



Fig. 1. *Baptisia australis*-*B. minor* complex; *B. villosa*.

Throughout the Middle West a blue-flowered, smaller-leaved, dichotomously and divaricately branched plant was found in great abundance and was accepted as *B. australis*. For many years this smaller type has been taken for *B. australis*, and at least four-fifths of the material examined in the course of this investigation proved to be the plant of questionable status. A comparison with authentic *B. australis* makes it very clear that the more western type is specifically distinct. Discovery of the type specimen of *B. minor* Lehm. in the Gray Herbarium indicates that this fact was recognized as early as 1827.

However, Lehmann's name has been universally regarded as a synonym of *B. australis*. In 1861, it was again described as *B. texana* by Buckley; but this name was not even generally honored as a synonym of *B. australis*. Not until 1932, when Small, in Rydberg's "Flora of the Prairies and Plains of Central North America," described a new species, *B. vespertina*, from Missouri, Kansas and Texas, was any widespread cognizance of its existence manifested. But Small's name, which has been recognized in the last few years, must go into syn-

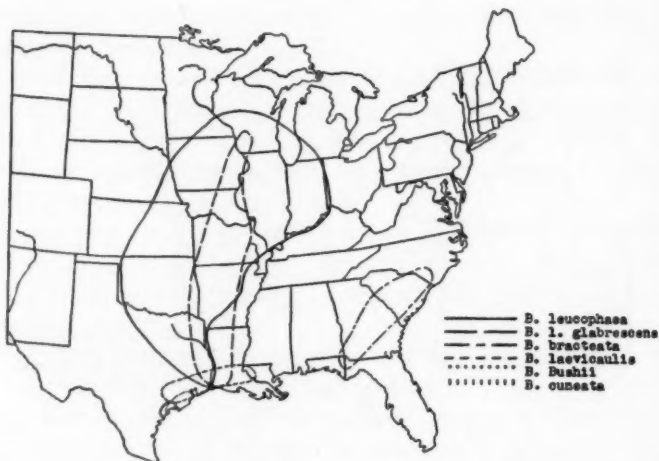


Fig. 2. *Baptisia bracteata*-*B. leucophaea* complex.

onymy along with *B. texana* Buckl. The true *B. australis* extends from Pennsylvania to southern Indiana, south to Virginia and Tennessee. It has been introduced in Vermont.

2. *Baptisia bracteata*-*B. leucophaea* complex: In the manuals, *B. bracteata* and *B. leucophaea* were treated as conspecific for several years and recognition was given to the earlier name, *B. bracteata*. In 1903, Small<sup>14</sup> recognized them as two distinct species, and his recognition has since been substantiated by most taxonomists. In a paper read by Dr. J. M.

<sup>14</sup> Small, Fl. Southeast. U. S., ed. 1, 600, 601. 1903.

Greenman<sup>15</sup> before the Illinois State Academy of Science at the East St. Louis meeting in May, 1933, the following differences were pointed out:

<i>B. bracteata</i> (Muhl.) Ell.	<i>B. leucophaea</i> Nutt.
1. Leaflets mostly 6–10 cm. long.	Leaflets averaging somewhat smaller.
2. Pedicels mostly less than 1.5 cm. long.	Pedicels more than 1.5 cm. long.
3. Pod not strongly reticulated, sparsely subappressed-pubescent.	Pod strongly reticulated, densely spreading-pubescent.
4. Plants of North Carolina and Georgia.	Plants of Central United States.

Further differences are indicated in the taxonomic section.

A variety of *B. leucophaea*, *B. leucophaea* Nutt. var. *laevicaulis*, from Louisiana and Texas, was proposed by Gray<sup>16</sup> in 1873, but no description accompanied the name; it was first described by Canby<sup>17</sup> in 1879. In 1895 Small<sup>18</sup> raised it to specific rank, describing it as *B. laevicaulis*. It has been confused with a glabrate variety of *B. leucophaea*, more extensive in range. The present treatment recognizes *B. laevicaulis* Small, and proposes for the more widespread type the name *B. leucophaea* var. *glabrescens*.

3. *Unique species of the southeastern states*: The southeastern states present a group of species in which there is marked fluctuation in morphological characters. Within this area there is a number of endemic species, especially in Florida but extending into South Carolina, Georgia and Alabama, which reveals rather interesting transitional stages, particularly in leaf characters. Trifoliolate, stipulate leaves are the rule in the genus and are invariably found in the species throughout the remainder of the distribution area. In the sandhills along the coastal plains of South Carolina and Florida, there is a species, *B. microphylla*, the lower leaves of which are trifoliolate and stipulate, the upper ones frequently simple, entire, clasping, or perfoliate. The transition is quite apparent for it

<sup>15</sup> Greenm. False Indigoes of the Mississippi Valley. Read at E. St. Louis meeting of Ill. State Acad. Sci. May, 1933.

<sup>16</sup> Hall's Pl. Texas 7. 1873.

<sup>18</sup> Bull. Torr. Bot. Club 25: 134. 1895.

<sup>17</sup> Bot. Gaz. 4: 132. 1879.

is possible to trace the gradual fusion of the stipules with the lower leaflets and of the leaflets themselves from the base of the stem upwards. In the same type of locality, but in a more extensive area, occurs a species, *B. perfoliata*, in which the perfoliate habit is definitely established. The pinelands of central Florida yield a species, *B. simplicifolia*, which has simple, entire, sessile leaves without stipules. A close degree of relationship apparently exists between these aberrant forms and the *B. sphaerocarpa-viridis* complex in Louisiana, Arkansas, Texas and Oklahoma. The leaves of *B. sphaerocarpa* are normal, i.e., trifoliolate; however, while the lower leaves of *B. viridis* are trifoliolate, the upper ones, and those terminating the lateral branches, are frequently bifoliolate and ultimately unifoliolate. There are no fusion stages apparent. Further evidence of this affinity is found in the mature pods which are ligneous, quite thick, and subglobose as in *B. perfoliata*. Accompanying this common pod character, there is a tendency toward a distinct ferruginous coloring in *B. perfoliata*, *B. sphaerocarpa*, and *B. viridis*, instead of the blackening characteristic of most of the other species.

Another interesting group in this area consists of *B. LeContei*, native of the pinelands and scrub along the coastal plains of Georgia and Florida; *B. calycosa* from the pinelands of eastern Florida; and *B. hirsuta*, endemic to the dry sandy pinelands of western Florida. All three differ from the rest of the species in the possession of a pair of bractlets slightly above the middle of the pedicel in addition to the solitary subtending bract, which is a constant character within the group. They are distinguished also by unique calyx characters, a fact which prompted Small to place them in a separate tribe, Calycosae. Throughout the genus the calyx is normally campanulate, the lobes shorter than the tube. *B. LeContei* retains the campanulate character, departing from the prevailing type only in the elongated lobes which are about equal to the tube in length. But *B. calycosa* and *B. hirsuta* have a very reduced calyx-tube and conspicuous foliaceous lobes at least four times the length of the tube, frequently completely obscuring the corolla.

Fig. 3. Southeastern-southwestern affinities of *Baptisia*.

The affinities of *B. leucantha* in South Carolina, Georgia, Florida and Alabama furnished one of the most perplexing problems in the present study. After much hesitation the group, which, for the most part, has been heretofore accepted as *B. leucantha*, was separated into two new species: *B. psammophila*, principally of Florida but extending into Georgia; and *B. pendula* of Georgia, South Carolina and northern Florida. Two varieties were assigned to the latter species: var. *obovata* of central South Carolina, with reasonable cer-



Fig. 4. *Baptisia alba*-*B. leucantha* complex.

tainty, and var. *macrophylla*, with considerable doubt. It occurs in Georgia, but a specimen found near Paducah, Kentucky, is identical with it. Further collections and detailed field study in the southeastern states are necessary before entirely satisfactory disposition can be made of these forms. In the light of specimens now in the major herbaria of the country, these conclusions seem the most plausible.

A new species and variety from along the Ochlockonee River in Florida have also been proposed: *B. riparia*, and var. *minima*. They are reminiscent of the *leucantha* alliance in that both blacken in drying; but the resemblance is only superficial as it is clearly distinguished on the basis of several characters.



The racemes are short, the flowers yellow, and the ovary pubescent.

4. *Hybridism*: The relatively frequent occurrence of hybridism, particularly in areas where the borders of the geographical ranges of some of the larger species overlap, has been the basis of much confusion. When it has been possible to establish with reasonable certainty the hybrid origin of a form, especially if it recurs in a number of localities in the vicinity of the suspected parents with a fair degree of intermediacy between them, binomials and descriptions have been proposed. There are a number of suspected cases, a few quite certain; but where direct evidence is lacking the plants in question are left "in statu quo" if they have previously been described, or described as novelties if not heretofore treated.

× *B. sulphurea* Engelm.: Dr. Engelmann was the first to suggest the idea of hybridity in *Baptisia* in his description of *B. sulphurea*,<sup>19</sup> pointing out that it grew in the presence of *B. sphaerocarpa* and "*B. australis*" (*B. minor*). Comparison of type material of *B. sulphurea* with the two other species leaves little doubt as to the wisdom of his assumption.

× *B. bicolor* Greenman & Larisey: Dr. Hitchcock<sup>20</sup> next called attention to the fact that "*B. australis*" (*B. minor*) and *B. leucophaea* hybridized in Kansas. Since then collections of the intermediate form have been made in southwestern Missouri and Oklahoma. It is one of the most definitely established cases in the genus. In general habit it more nearly resembles *B. minor*, but the flowers are bicolorous: the standard blue as in *B. minor*, the wings and keel yellow as in *B. leucophaea*. Back-crosses to *B. leucophaea* are apparently common.

× *B. intermedia* Larisey: In April, 1936, Dr. Harper<sup>21</sup> called to the attention of the author a case involving *B. viridis* ("*B. sphaerocarpa*") and *B. leucophaea* var. *glabrescens* in Louisiana. Specimens of *B. viridis* and the hybrid were forwarded for study, but unfortunately no collections of *B. leucophaea*

<sup>19</sup> Engelmann, G. in Bot. Gaz. 3: 65. 1878.

<sup>20</sup> Hitchcock, A. S. in Bot. Gaz. 19: 42. 1894.

<sup>21</sup> Harper, R. M. in Torreya 38: 121-124. 1938.

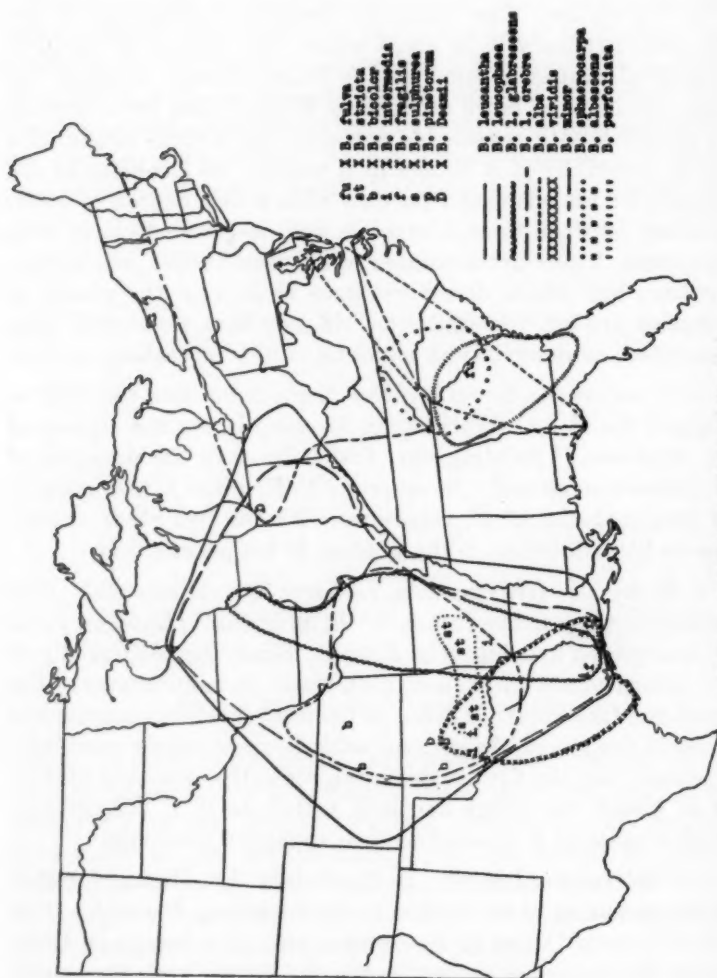


Fig. 5. Hybrid complexes of *Baptisia*.

var. *glabrescens* were made at the time. Photographs taken in the field, and a specimen collected from the same locality several years ago, however, leave no doubt as to its identity.

× *B. stricta* Larisey: The parents of this hybrid are apparently *B. leucophaea* and *B. sphaerocarpa*. This particular set-up has solved one of the greatest problems in the group. *B. villosa* (Walt.) Nutt., a southeastern coastal-plain species, has been reported in the manuals as occurring also in Arkansas. It has been generally supposed that these reports have been based on incorrect determinations of *B. Nuttalliana*. However, the discovery of specimens labelled "*B. villosa*" and collected by Nuttall in Arkansas dispelled that notion. The existence of several other questionable specimens from Texas and Oklahoma merely added to the confusion until careful study showed them to be intermediate between *B. leucophaea* and *B. sphaerocarpa*; and while there is more variability among them than in most of the other hybrids, there seems little doubt as to their status.

× *B. fragilis* Larisey: In southeastern Texas Dr. E. Anderson collected excellent flowering material of *B. viridis*, *B. leucantha*, and a hybrid between them. This has been the most ideal complex of all because specimens were taken from about sixty plants, making possible detailed comparative study of morphological characters. Arbitrary index values were assigned to the most significant characters, and the index value of a plant equaled the sum of the values of its various characters. In this way it was possible to plot the entire lot on a chart which grouped the two species at the opposite ends of the table, the hybrids in the middle, and back-crosses scattered in the direction of the respective parent species. Pollen counts were also made, revealing a variable but higher percentage of bad pollen than in either of the parent species. Specimens obviously belonging to similar complexes were found from another locality in Texas, and in Louisiana.

× *B. Deamii* Larisey: Through the kindness of Mr. C. C. Deam, study of a case of hybridism between *B. tinctoria* var. *crebra* and *B. leucantha* in low sandy woods in northern Indiana was made possible. This problem is one of the few where

ample fruiting as well as flowering material has been available.

× *B. pinetorum* Larisey: A similar complex exists in a sandy pine woods in Accomac County, Virginia, between *B. tinctoria* var. *crebra* and *B. alba*. Collections of *B. tinctoria* var. *crebra* from this region are quite rare, but two specimens have been seen which are apparently authentic. The rest of the material is of *B. alba*, the hybrid, and back-crosses mostly to *B. alba*. While several specimens from this section are in a number of herbaria, a gift of a set of twenty specimens from



Fig. 6. *Baptisia tinctoria* complex; *B. riparia* and *B. megacarpa*.

Dr. Robert R. Tatnall and Dr. Frank M. Jones was an invaluable aid to the investigation.

× *B. fulva* Larisey: This hybrid occurs in the sand hills around Augusta, Georgia, and collections of it and the two parents—*B. albescens* and *B. perfoliata*—were made in 1900 by Mr. A. Cuthbert. The three specimens are in the herbarium of the New York Botanical Garden.

Suspected cases of hybridism for which there is no definite proof are *B. microphylla*, a probable cross between *B. perfoliata* and *B. tinctoria*; and *B. Serenae*, which has many characters intermediate between *B. alba* and *B. tinctoria*. However,

the known hybrid between these two species is quite distinct from *B. Serenae*; and if it be of such remote origin, some other element has exerted a strong influence in the course of its evolutionary development.

Two new species are described herein from southern Louisiana, a region particularly rich in diverse forms, and where at least two cases of hybridism are known. *B. intercalata*, which is closely related to *B. Nuttalliana*, suggests hybridity; but there is no evidence. *B. macilenta* resembles  $\times B. fragilis$  very strongly, but has a slightly pubescent pod; but there is undoubtedly an affinity with *B. leucantha*. Two new varieties of *B. leucantha* from this same area (var. *divaricata* and var. *pauciflora*) seem to bear a close relationship with *B. macilenta*, but are glabrous as is the true species.

#### GROSS MORPHOLOGY

*Root:* The roots are of the fibrous type and are not distinguished by any outstanding character peculiar to the group.

*Stem:* The underground stems consist of rather large, woody, perennial rhizomes which give rise to the aerial portion of the plant each year. The upright stems are usually terete, ribbed, stout or slender, succulent or firm, glabrous or pubescent, frequently glaucous; they are usually erect, but occasionally declining, sparingly or more often widely branched, the branches simple and erect, geniculate, or subdichotomous and divaricate.

*Leaves:* The leaves are typically ternately compound, subsessile to petiolate, stipulate, glabrous or pubescent, frequently glaucous on the lower surface; the leaflets are subsessile to petiolate, varying from broadly elliptic, narrowly elliptic, oblanceolate, obovate, to rhombic cuneate, apex acute to obtuse; the stipules vary from minutely setaceous, through deltoid, triangular-lanceolate, to large-foliaceous and may be persistent or caducous. In a few species the leaves are simple, sessile or perfoliate, without stipules.

*Flowers:* The flowers are perfect and normally borne in loose terminal or axillary racemes; occasionally they occur singly in the axils of the upper leaves.

*Floral bracts:* The floral bracts are lanceolate-setaceous to ovate-acuminate, foliaceous, deciduous or persistent.

*Pedicels:* The flowers are always pedicellate, the pedicels usually rather slender, varying in length from 1 to 4 centimeters.

*Calyx:* The calyx is almost universally campanulate, bilabiate, four- or five-parted; the upper lip may be entire, ovate or truncate, emarginate, or two-lobed; the lower lip is distinctly three-lobed, lobes deltoid-ovate to lanceolate, acuminate, usually shorter than the tube. Occasionally the calyx-tube is greatly reduced and the lobes assume a large foliaceous habit.

*Corolla:* The corolla is papilionaceous, irregular, the five parts arranged in the following manner: the upper one, standard or vexillum, broad and usually laterally reflexed, emarginate or entire, occasionally auriculate at the base; the two lateral ones, wings, enclosing the two lower ones which are more or less united to form the keel—the keel curving upward. The petals are more nearly equal in length than in most leguminous genera, but the standard is usually shorter than the others. The petals are deciduous.

*Stamens:* There are ten equal stamens, distinctive in that they are not united into a tube at the base. They are also deciduous.

*Ovary and Mature Fruit:* The ovary is superior, short-stipitate, with an incurved style and simple stigma, and may be glabrous or pubescent. The mature fruit is unilocular, unicarpellary, many-seeded, dehiscent, short- or long-stipitate, gradually or abruptly beaked, usually inflated, ligneous-coriaceous or rarely membranaceous, globose, ovoid, elliptic, oblongoid or cylindric, glabrous, strigillose, or pubescent.

#### GENERIC AFFINITIES

*Baptisia* is most closely allied to the following genera, and has been involved with them in questions of synonymy: *Thermopsis*, *Sophora*, *Crotalaria* and *Podalyria*.

*Thermopsis* is a perennial herbaceous genus native of North America and Asia. In the United States it seems to have taken



the place of *Baptisia* in the Far West. Its chief differences from *Baptisia* are found mainly in fruit characters: the pod is sessile or very short-stipitate, flat rather than inflated, and is linear or oblong, straight or curved.

*Sophora* is a rather widespread genus—shrubs or herbs in the temperate regions, and trees in the tropics. It is characteristic in having odd-pinnate leaves; a campanulate calyx which is very shortly five-toothed, at times the upper margin being almost entire; and the fruit is constricted between the seeds and indehiscent.

*Crotalaria* consists chiefly of tropical herbs, and the stipules are characteristically decurrent on the stems and branches, a condition never found in *Baptisia*; the calyx is bilabiate with a prominently two-lobed upper lip and a deeply three-lobed lower lip; the pod is globular to cylindric and the seeds loosen, giving the genus the common name Rattlebox.

*Podalyria*, the genus with which all the early *Baptisia* species were associated, is now restricted to a group of African shrubs which have united persistent stamens.

#### ECONOMIC VALUE

For a number of years certain species of *Baptisia*, especially *B. tinctoria*, constituted the source of a substitute for indigo. This fact contributed the generic name, as the word *Baptisia* comes from the Greek "βαπτίζειν," meaning to dip or dye. The Baptisias are frequently called False Indigoes. *Indigofera* is now used to a limited extent for the production of indigo, and *Baptisia* plays very little part in the industry today.

#### ABBREVIATIONS OF HERBARIA

- MBG—Missouri Botanical Garden.
- USN—United States National Museum.
- GH—Gray Herbarium of Harvard University.
- NYB—New York Botanical Garden.
- ANSP—Academy of Natural Sciences of Philadelphia.
- FM—Field Museum of Natural History.
- UP—University of Pennsylvania.
- UNC—University of North Carolina.
- DU—Duke University.
- CM—Charleston Museum.

- CA—Clemson Agricultural College.  
 UF—University of Florida.  
 UG—University of Georgia.  
 OU—Ohio State University.  
 LB—Dr. E. Lucy Braun.  
 IU—Indiana State University.  
 CD—Charles C. Deam.  
 ND—University of Notre Dame.  
 LU—Louisiana State University.  
 TU—Tulane University.  
 UM—University of Minnesota.  
 UW—University of Wisconsin.  
 UN—University of Nebraska.  
 KA—Kansas State Agricultural College.  
 UO—University of Oklahoma.  
 OAM—Oklahoma Agricultural and Mechanical College.  
 UT—University of Texas.  
 NM—New Mexico College of Agriculture and Mechanical Arts.

## TAXONOMY

**Baptisia** Vent. Dec. Gen. Nov. 9. 1808; R. Br. in Ait. Hort. Kew., ed. 2, 3: 5. 1811; Ell. Sketch Bot. S. Car. & Ga. 1: 466. 1821; DC. Prodr. 2: 100. 1825; Chapman, Fl. South. U. S., ed. 1, 110. 1860, ed. 2, 110. 1889, and ed. 3, 120. 1897; Torr. & Gray, Fl. N. Am. 1: 383. 1840; Benth. & Hook. Gen. Pl. 1: 466. 1862-67; Hoffm. in Engler & Prantl, Nat. Pflanzenfam. III. 3: 200. 1894; Britton & Brown, Illust. Fl. North. U. S., ed. 1, 2: 265. 1897, and ed. 2, 2: 344. 1913; Small, Fl. Southeast. U. S., ed. 1, 597. 1903, and ed. 2, 597. 1913; Gray, New Man. Bot., ed. 7, 505. 1908; Rydb. Fl. Prairies and Plains Central N. Am. 455. 1932; Small, Man. Southeast. Fl. 674. 1933.

*Crotalaria* Dill. ex Linn. Gen. Pl., ed. 1, 218. 1737, in part.

*Sophora* Linn. Gen. Pl., ed. 1, 125. 1737, in part.

*Podalyria* Lam. Illust. 2: 454. pl. 327, fig. 3, 4. 1793, in part.

*Crotalopsis* Michx. ex DC. Prodr. 2: 100. 1825, in syn.

*Eaplosia* Raf. New Fl. N. Am. 2: 51. 1836 [1837].

*Lasinia* Raf. New Fl. N. Am. 2: 48. 1836 [1837].

*Pericaulon* Raf. New Fl. N. Am. 2: 50. 1836 [1837].

*Ripasia* Raf. New Fl. N. Am. 2: 48. 1836 [1837].

Perennial herbs with stout, woody rhizomes. Plant usually darkening, occasionally blackening, rarely remaining unchanged in drying, glabrous throughout, somewhat glaucous,

or minutely to densely appressed-pubescent throughout or in parts, sometimes villous, rarely hirsute. Stems usually erect, occasionally declined, stout-succulent or slender-firm, terete, heavily to lightly ribbed, sheathed at the base with conspicuous scales; branches arising alternately from a single primary stem, or main stem diffusely branching from the base, secondary branches subdichotomous, geniculate or straight, ascending, divaricate, or lateral ones sometimes declined. Leaves alternate, usually trifoliolate, occasionally bifoliolate, simple or perfoliate, sessile to petiolate, usually stipulate, stipules minute, setaceous, lanceolate to ovate-cordate and foliaceous, persistent or deciduous; leaflets usually sessile, occasionally short-petiolate, obovate, oblanceolate to lanceolate, elliptic or rhombic, usually cuneate, apex acute, rounded, obtuse, retuse or slightly mucronate, firm or delicate. Flowers perfect, normally borne in terminal, axillary, or rarely intercalary racemes, occasionally borne singly in axils of the upper leaves; floral bracts setaceous-lanceolate to ovate-acuminate, foliaceous, deciduous or persistent; pedicels slender; calyx campanulate, bilabiate, four- to five-parted, upper lip entire, emarginate or two-lobed, lower lip distinctly three-lobed, lobes usually shorter than the tube, occasionally three to four times longer; corolla white, cream, yellow, blue or bicolorous, irregular, papilionaceous; petals 5, deciduous, standard reniform or suborbicular, usually laterally reflexed, occasionally auriculate, wings and keel erect, about equal in length; stamens ten, distinct, deciduous; ovary superior, stipitate, style incurved, stigma simple. Mature pod globose, ovoid, elliptic, oblongoid or cylindrical, usually inflated, ligneous to membranaceous, smooth, rugose or strongly reticulate, many-seeded, short- or long-stipitate, short- or long-beaked, beak incurved.

Distribution: North America: Vermont to Florida, west to Minnesota, south to Texas.

Type species: *Baptisia alba* (L.) Vent.

#### KEY TO THE SPECIES

- 1a. Leaves simple, exstipulate
- 1b. Leaves sessile, flowers racemose.....1. *B. simplicifolia*
- 2b. Leaves perfoliate, flowers axillary.....2. *B. perfoliata*

- 2a. Lower leaves trifoliate, upper bifoliate and unifoliate, all stipulate... 43. *B. viridis*
- 3a. Leaves trifoliate, stipulate
- 1b. Stipules partially or wholly united with the leaflets
- 1c. Leaflets 2.5-3 cm. long, 1-1.5 cm. broad... 3. *B. microphylla*
- 2c. Leaflets 3.5-5.5 cm. long, 2-3 cm. broad... 4. *B. fulva*
- 2b. Stipules not united with the leaflets
- 1c. Calyx-lobes equal to the tube, or longer
- 1d. Calyx-lobes equal to the tube
- 1e. Leaflets 1.5-2.5 cm. long... 5. *B. LeContei*
- 2e. Leaflets 4-5 cm. long... 6. *B. LeContei* f. *robustior*
- 2d. Calyx-lobes several times longer than the tube
- 1c. Plant essentially glabrous... 7. *B. calycosa*
- 2c. Plant hirsute... 8. *B. hirsuta*
- 2c. Calyx-lobes shorter than the tube
- 1d. Flowers both axillary and racemose
- 1e. Leaflets spatulate to oblanceolate... 9. *B. lanceolata*
- 2e. Leaflets broadly elliptic
- 1f. Lower leaf-surface glabrate... 10. *B. elliptica*
- 2f. Lower leaf-surface tomentose... 11. *B. elliptica* var. *tomentosa*
- 3e. Leaflets obovate-cuneate
- 1f. Racemes terminal... 12. *B. Nuttalliana*
- 2f. Racemes intercalary... 13. *B. intercalata*
- 2d. Flowers racemose
- 1e. Flowers secund
- 1f. Racemes declined
- 1g. Leaflets oblanceolate-elliptic, 5-10 cm. long, softly pubescent... 14. *B. bracteata*
- 2g. Leaflets narrowly oblanceolate-spatulate, 3-10 cm. long, villous
- 1h. Stems villous... 15. *B. leucophaea*
- 2h. Stems glabrous, or nearly so... 16. *B. leucophaea* var. *glabrescens*
- 3g. Leaflets rhombic-obovate, 4-7 cm. long, margins ciliate... 17. *B. laevicaulis*
- 4g. Leaflets cuneate-obovate, 3-6 cm. long, margins not ciliate... 18. *B. cuneata*
- 2f. Racemes not declined
- 1g. Stems glabrous or glabrate... 19. *B. intermedia*
- 2g. Stems finely villous... 20. *B. stricta*
- 3g. Stems woolly-tomentose... 21. *B. Bushii*
- 2e. Flowers not secund
- 1f. Flowers white
- 1g. Pod cylindrical, yellow-brown
- 1h. Leaflets 2-3 cm. long, lower surface glabrous-glaucous... 22. *B. alba*
- 2h. Leaflets 3.5-6 cm. long, lower surface finely pubescent... 23. *B. albescent*
- 2g. Pod subglobose to elliptic-oblongoid, black
- 1h. Racemes 1.5-2.5 dm. long, rarely exceeding the foliage

- 1i. Leaflets elliptic, apex acute, 4-6 cm. long, 1-2 cm. broad  
.....24. *B. pendula*
- 2i. Leaflets obovate, 2-3.5 cm. long, 1-1.5 cm. broad.....  
.....25. *B. pendula* var. *obovata*
- 3i. Leaflets broadly elliptic-obovate, apex obtuse-rounded,  
4-6 cm. long, 2-2.5 cm. broad.....  
.....26. *B. pendula* var. *macrophylla*
- 2h. Racemes 1-6 dm. long, exceeding the foliage
- 1i. Pod firm, inflated, smooth, rugose
- 1j. Branches ascending.....27. *B. leucantha*
- 2j. Branches divaricate
- 1k. Pod subglobose-ovoid, inequilateral.....  
.....28. *B. leucantha* var. *divaricata*
- 2k. Pod elliptic-oblongoid.....  
.....29. *B. leucantha* var. *pauciflora*
- 2i. Pod thin, folded, strongly reticulate.....  
.....30. *B. psammophila*
- 2f. Flowers cream or yellow
- 1g. Plant pubescent throughout.....31. *B. villosa*
- 2g. Plant pubescent only in parts, essentially glabrous
- 1h. Racemes less than 1.5 dm. long
- 1i. Leaflets obovate-cuneate, less than 1.5 cm. long.....  
.....32. *B. tinctoria*
- 2i. Leaflets obovate-lanceolate-cuneate, more than 1.5 cm.  
long.....33. *B. tinctoria* var. *crebra*
- 3i. Leaflets spatulate-elliptic, 3-6 cm. long.....33. *B. macilenta*
- 4i. Leaflets obovate-lanceolate, 3.5-7 cm. long
- 1j. Leaflets glabrous.....39. *B. riparia*
- 2j. Leaflets pubescent along midvein.....  
.....40. *B. riparia* var. *minima*
- 5i. Leaflets broadly elliptic, 4-5 cm. long.....41. *B. megacarpa*
- 2h. Racemes more than 1.5 dm. long
- 1i. Pod firm but thin, rugose-reticulate
- 1j. Pod black
- 1k. Leaflets oblanceolate-cuneate, 1.5-4 cm. long.....  
.....34. *B. tinctoria* var. *projecta*
- 2k. Leaflets broadly obovate, 2.5-4.5 cm. long.....  
.....35. *B. Deamii*
- 2j. Pod yellow- to purplish-brown
- 1k. Leaflets obovate, obtuse-rounded....36. *B. pinetorum*
- 2k. Leaflets oblanceolate-elliptic, acute-rounded.....  
.....37. *B. Serenae*
- 2i. Pod ligneous, smooth
- 1j. Calyx-lobes lanceolate, nearly half the length of the  
tube
- 1k. Branches straight, leaflets 4.5-8 cm. long.....  
.....42. *B. sphaerocarpa*
- 2k. Branches geniculate, leaflets 2.5-5 cm. long.....  
.....43. *B. viridis*

- 2j. Calyx-lobes deltoid-ovate, one-fourth to one-third the length of the tube  
 1k. Stipules setaceous-caducous, leaflets 2.5–3.5 cm. long ..... 44. *× B. fragilis*  
 2k. Stipules lanceolate, 0.7–1 cm. long, usually persistent, leaflets 3.5–5 cm. long ..... 45. *× B. sulphurea*  
 3f. Flowers blue  
 1g. Branches ascending, leaflets 4–8 cm. long ..... 46. *B. australis*  
 2g. Branches divaricate, leaflets 1.5–5.5 cm. long  
 1h. Plants of middle and southwestern United States. . . 47. *B. minor*  
 2h. Plants of North Carolina, Georgia and Tennessee .....  
 ..... 48. *B. minor* var. *aberrans*  
 4f. Flowers bicolorous ..... 49. *× B. bicolor*

**1. *B. simplicifolia*** Croom in Am. Jour. Sci. 25: 74. 1834; Jour. Acad. Nat. Sci. Phila. 7: 96. 1834; Torr. & Gray, Fl. N. Am. 1: 383. 1840; Chapman, Fl. South. U. S., ed. 3, 120. 1897; Small, Fl. Southeast. U. S., ed. 1, 598. 1903, and ed. 2, 598. 1913; Small, Man. Southeast. Fl. 675. 1933.

*Eaplosia ovata* Raf. New Fl. N. Am. 2: 52. 1836 [1837].

Plant 1 m. or less high; stems firm, lightly ribbed, erect, much-branched, branches geniculate, ascending; leaves dark green, blackening in drying, simple, sessile, entire, margins revolute, blades firm, reticulate, glabrous, lustrous above, ovate, obtuse or retuse, 4–10 cm. long, 3–6 cm. broad; racemes terminal, compact, 1–2 dm. long; flowers pedicellate, pedicels 4–8 mm. long, the lowermost subtended by foliaceous bracts 1.5 cm. long, 1 cm. broad, the uppermost by smaller oblong or obovate persistent bracts 5 mm. long, 2 mm. broad; calyx campanulate, glabrous without, finely pubescent within, 5 mm. long, upper lip broad, entire or minutely cleft, lobes of lower lip ovate or oblong-ovate, 2.5–3 mm. long; corolla yellow, standard reniform, 1.2 cm. long, 1 cm. broad, wings and keel oblong, 1.5 cm. long; pod pubescent when young, glabrate at maturity, ellipsoid or ovoid, body 1–1.5 cm. long, long-beaked, beak slightly recurved, short-stipitate, stipe 4–6 mm. long.

Distribution: dry pinelands, Florida.

CITATION OF SPECIMENS:

FLORIDA: without definite locality, "Chapman mis. 1846" (MBG); Quincy, Chapman (USN, ANSP); "in pinetis ad Quincy," June, Chapman (GH); Quincy, 1835, Chapman (NYB); on Jackson Bluff road, Leon Co., 20 mi. west of Tallahassee, Aug. 1935, Kurz (MBG); near Quincy, coll. of 1833, Loomis & Croom (MBG, TYPE); in oak forest toward Springerag near Shellpoint, July, 1843, Ruget (MBG,



NYB); pinelands west of Ochlockonee River, Leon Co., Nov. 28, 1920, *Small, Harper & Gunter 9671* (NYB,GH); white cedar swamp east of Bristol, July 12, 1924, *Small, Small & De Winkeler 11450* (NYB); Black Jack oak scrub, Quincy, Sept. 8, 1931, *West* (MBG).

**2. *B. perfoliata* (L.) R. Br.** in Ait. Hort. Kew., ed. 2, **3**: 5. 1811; Ell. Sketch Bot. S. Car. & Ga. **1**: 467. 1821; DC. Prodr. **2**: 100. 1825; Lodd. Bot. Cab. **12**: *pl. 1104*. 1826; Hook. Bot. Mag. II. **5**: *pl. 3121*. 1831; Torr. & Gray, Fl. N. Am. **1**: 383. 1840; Chapman, Fl. South. U. S., ed. 3, 120. 1897; Small, Fl. Southeast. U. S., ed. 1, 598. 1903, and ed. 2, 598. 1913; Small, Man. Southeast. Fl. 675. 1933.

*Crotalaria perfoliata* L. Sp. Pl. **2**: 714. 1753.

*Sophora perfoliata* Walt. Fl. Car. 135. 1788.

*Rafnia perfoliata* Willd. in L. Sp. Pl. ed. 4, **3**: 949. 1800.

*Podalyria perfoliata* Michx. Fl. Bor. Am. **1**: 263. 1803; Pursh, Fl. Am. Sept. **1**: 307. 1814.

*Pericaulon perfoliatum* Raf. New Fl. N. Am. **2**: 51. 1836 [1837].

*Pericaulon cordatum* Raf. New Fl. N. Am. **2**: 51. 1836 [1837].

Plant less than 1 m. high, glabrous, somewhat glaucous; stems lemon- to tawny-yellow, widely branched, branches stiff, arching; leaves pale yellow-green, simple, perfoliate, mostly vertical, one-ranked due to alternate right and left torsion of the internodes, blades entire, leathery, orbicular to ovate, 5–10 cm. long, 3–8 cm. broad, rounded at both ends or notched at apex, finely reticulated; flowers axillary, solitary, pedicellate, pedicels 4–8 mm. long, ascending; calyx campanulate, densely pubescent within, 6–7 mm. long, upper lip usually deeply cleft, lobes deltoid, those of the lower lip ovate, 1.5–2.5 mm. long; corolla yellow, standard reniform, 0.8 cm. long, 1 cm. broad, wings and keel 1–1.3 cm. long; mature pods ligneous, rugose, ferruginous, ovoid to globose, 1–1.5 cm. long, 1 cm. broad, constricted at both ends, short-stipitate, stipe barely exceeding the calyx, abruptly short- and slender-beaked, beak usually breaking off.

Hybridizes with *B. albescens* in Georgia.

Distribution: sand hills and pine barrens, South Carolina to Florida.

## CITATION OF SPECIMENS:

SOUTH CAROLINA: Aiken, May 1869, *Canby* (MBG,USN,GH,NYB,FM); Aiken, Aug. 1866, *Ravenel* (MBG); Aiken, June 1869, *Ravenel* (USN); Aiken, June and July 1870, *Ravenel* (NYB); Aiken, 1871, *Ravenel* (MBG); Aiken, June 1847, *Wallace* (CM).

GEORGIA: pine barrens, McRea, June 7, 1900, *Biltmore Herb. 1600a* (NYB); sandy soil, Summerville, July 21, 1905, *Biltmore Herb. 1600b* (UM); no definite locality, *Chapman* (USN); dry pine barrens, Oliver, July 6, 1901, *Curtiss 6333* (MBG,GH,NYB,UM,UN,KA); open oak woods, sand hills, Augusta, May 1900, *Cuthbert 178* (NYB); dry hills north of Belair, Richmond Co., May 22, 1899, *Eggert* (MBG); dry sandy soil at Butts, Emanuel Co., June 6, 1901, *Harper 802* (MBG,USN,NYB); among sand hills between Grovetown and Forrest, Columbia Co., June 10, 1902, *Harper 1310* (MBG,USN,GH,NYB); Louisville, May 1894, *Hopkins 2983, 2984, & 2988* (MBG); no definite locality, April 1903, *Prior ex Herb. Kew.* (USN); dry sand hills 5 mi. east of McBean, Burke Co., April 10, 1833, *Pyron & McVough 2457* (MBG); Augusta, Richmond Co., June 27-July 1, 1895, *Small* (NYB,UM); sandy pine barren hills north of Augusta, Sept. 21, 1883, *Smith* (USN); Waycross, April, *Williamson* (NYB).

FLORIDA: sandy pine land, Chuluota, Seminole Co., May 18, 1929, *Rapp 1* (NYB); sandy scrub, Orlando, June 17, 1929, *West* (MBG).

3. *B. microphylla* Nutt. in Jour. Acad. Nat. Sci. Phila. 7: 97. 1834; Torr. & Gray, Fl. N. Am. 1: 383. 1840; Chapman, Fl. South. U. S., ed. 1, 111. 1860, and ed. 2, 111. 1889; Small, Fl. Southeast. U. S., ed. 1, 598. 1903, and ed. 2, 598. 1913; Small, Man. Southeast. Fl. 675. 1933.

*Baptisia stipulacea* Ravenel in Ell. Soc. Nat. Hist. 1: 38. pl. 2. 1856; Chapman, Fl. South. U. S. ed. 3, 121. 1897.

*B. microphylla* Nutt. var. *axillaris* Canby in Bot. Gaz. 4: 130. 1879.

*B. perfoliata* (L.) R. Br. var. *lobata* Canby in Bot. Gaz. 4: 130. 1879.

*Pericaulon microphyllum* Raf. New Fl. N. Am. 2: 51. 1836 [1837].

Plant 1 m. or less high, glabrous; stem widely branched, lateral branches arising from a single, erect, primary stem; leaves deep yellow-green, blackening in drying, lowermost ternately compound, petiolate, petioles 2-6 mm. long, uppermost simple, sessile, entire, clasping or semiamplexicaul, occasionally perfoliate, leaflets firm, reticulate, obovate, cuneate, or broadly spatulate, rounded at apex or apiculate, 2.5-3 cm. long, 1-1.5 cm. broad; persistent stipules foliaceous, ovate, variable in size, partially or wholly united with the leaf-blades;

flowers axillary or racemose, the latter subtended by cordate, foliaceous bracts 4 mm. long, 3 mm. broad; pedicels semipersistent, 0.8–1 cm. long; calyx campanulate, pubescent within, 5–6 mm. deep, upper lip entire, truncate or slightly emarginate, lobes of the lower lip deltoid, 2–2.5 mm. long; corolla yellow, standard 9 mm. high, 1 cm. broad, wings and keel 1–1.2 cm. long; pod brownish-black, somewhat glaucous, cartilaginous, ovoid, rarely subglobose, constricted at both ends, body 1–1.3 cm. long, stipitate, stipe 4–8 mm. long, short-beaked, beak recurved.

Distribution: sand hills, coastal plain, South Carolina to Florida.

CITATION OF SPECIMENS:

SOUTH CAROLINA: Aiken, May 1859, *Buckley* (MBG); Aiken, May 1869, *Canby* (MBG,USN,GH,NYB,FM); sand hills, Aiken, June, *Ravenel* (GH,TYPE of *B. stipulacea* Rav., CM); dry sandy soil, Aiken, *Ravenel* (MBG,USN,ANSP,FM); Aiken, June 1853, Herb. A. Gray, *Ravenel* (NYB); Aiken, June 1868, *Ravenel* (NYB); Aiken, June 1869, *Ravenel* (USN); Aiken, July 1870, *Ravenel* (NYB); Aiken, June 1878, *Ravenel* (ANSP); Aiken, coll. of 1880, *Ravenel* (USN).

FLORIDA: no definite locality, *Nuttall* (ANSP,TYPE, NYB).

4.  $\times$  *B. fulva* Larisey, *hyb. nov.*<sup>22</sup>

= *B. perfoliata*  $\times$  *B. albescens*.

Height unknown; plant yellow-green throughout, drying deep tawny in parts; stem slender, firm, simply branched, branches ascending-spreading; leaves petiolate, petioles 3–7 mm. long, lowermost leaves trifoliolate, stipulate, stipules foliaceous, cordate-ovate, round at apex, amplexicaul, 0.5–2 cm. long, uppermost leaves bifoliolate to unifoliolate through irregular fusion of leaflets with stipules, leaflets obovate-cuneate, apex rounded to broadly acute, seldom retuse, 3.5–5.5 cm. long, 2–3 cm. broad; flowers axillary or in terminal racemes, racemes 1–1.5 dm. long; floral bracts foliaceous, cordate, acuminate, 0.5–1 cm. long; pedicels 3–5 mm. long; calyx-tube 5–6 mm. deep, upper lip truncate to slightly emarginate, lobes of the lower lip deltoid-ovate, 3 mm. long; corolla pale yellow, drying deep bronze, standard 1.2–3 cm. high, wings and keel

<sup>22</sup> Inter *perfoliatam* et *albescentem* media: foliola 3, 2, vel 1, obovata cuneata apice rotundata raro retusa; flores axillares vel racemosi; corolla flavo-fulva.

1.4-5 cm. long; mature pod parchment-like, ferruginous, reticulate, cylindrical, 2-2.2 cm. long, 0.5-0.7 cm. broad, abruptly short-beaked, long-stipitate, stipe 5-7 mm. long.

Distribution: open sandy pine woods, central-eastern Georgia.

CITATION OF SPECIMENS:

GEORGIA: Waynesboro, 1860, *Cleveland* (UF); in open pine woods, sand hills, Augusta, May 25, 1900, *Cuthbert* 177 (NYB,TYPE, UF).

5. **B. LeContei** Torr. & Gray, Fl. N. Am. 1: 386. 1840; Chapman, Fl. South. U. S., ed. 3, 121. 1897; Small, Fl. Southeast. U. S., ed. 1, 598. 1903, and ed. 2, 598. 1913; Small, Man. Southeast. Fl. 675. 1933.

Plant 1 m. or less high, minutely pubescent; stem slender, firm, diffusely branched, branches geniculate; leaves bright yellow-green, retaining color in drying, lowermost short-petiolate, petioles 2-4 mm. long, upper ones subsessile, leaflets cuneate-obovate to oblanceolate or spatulate, 1.5-2.5 cm. long, 1-1.5 cm. broad, margins revolute, apex usually slightly apiculate, rarely retuse; stipules minute, subulate, caducous, lower ones sometimes larger, 3-6 mm. long, 1 mm. broad, and persistent; racemes numerous, short, barely exceeding the foliage; pedicels slender, 2.5-3.5 cm. long, subtended by foliaceous, ovate bracts 7-9 mm. long, 3 mm. broad, and bibracteolate above the middle, bracteoles 3 mm. long, 1 mm. broad; calyx campanulate, 5-6 mm. deep, upper lip almost entire, lower lobes lanceolate or subulate-lanceolate, as long as the tube or longer, 3-4 mm. long; corolla yellow, standard suborbicular, 1 cm. high, 1 cm. broad, wings and keel 1-1.2 cm. long; pod yellow-brown to blackish, coriaceous, rugose or lightly reticulate, finely pubescent, ellipsoid, body 1.3 cm. long, up to 1 cm. broad, narrowed at both ends, stipe 5-7 mm. long, abruptly beaked, beak recurved.

Distribution: dry sandy plains, pine lands, and scrub, Georgia and Florida.

CITATION OF SPECIMENS:

GEORGIA: sandy soil, Twin Lakes, 12 mi. southeast of Valdosta, Lowndes Co., May 15, 1938, *Berryman* (MBG); no definite locality, *Le Conte* (NYB).

FLORIDA: high pine land, Jessamine, Pasco Co., May 4-18, 1897, *Barnhart* 2186 (FM); high pine land, Haines City, April 24, 1930, *Blanton* 6429 (USN,GH);

sandy fields near Jennings, Hamilton Co., June 6, 1930, *Bright 4779* (CD); no definite locality, *Chapman* (USN,GH); Jacksonville, *Chapman* (NYB); Carrabelle, Oct. 1896, *Chapman* (MBG); dry pine barrens near Jacksonville, June, *Curtiss 694* (MBG,USN,GH,NYB,FM,UM,UN); dry pine barrens near Jacksonville, May 30, 1894, *Curtiss 4828* (USN,GH,FM,UM); no definite locality, ex *Chapman*, *Curtis* (GH); Waldo, *Gilman 803* (USN); Wakulla Co., Aug. 12, 1924, *Handley A 141* (USN); dry sandy pine barrens between Otter Creek and Panacea, Wakulla Co., July 19, 1925, *Harper 49* (GH,NYB); dry sand barrens between Sopchoppy and Panacea, Wakulla Co., June 19, 1910, *Harper 80* (GH,NYB,UM); high pine land, Columbia Co., 1898, *Hitchcock* (MBG); high pine land, Citrus Co., June-July, 1898, *Hitchcock 356* (FM); Hernando Co., June-July, 1898, *Hitchcock 357* (FM); between Medart and Panacea, Wakulla Co., May 5, 1935, *Kurz* (MBG); 3 mi. south of Woodville, Leon Co., May 29, 1935, *Kurz* (MBG); St. Nicholas, May 12, 1896, *Lighthipe* (WU,UM); south of Jacksonville, May 10, 1898, *Lighthipe 228* (MBG, WU,UM); dry sandy field north of Palm Harbor, Pinellos Co., April 25, 1930, *Moldenke 1039a* (MBG,NYB,DU); dry sandy field, Elfers, Pasco Co., April 25, 1930, *Moldenke 1061* (MBG,NYB,DU); in pinelands, Lake Jovita, April 18, 1927, *O'Neill* (MBG); "ad colles arenosos inter Volusia et Ft. Oclawaha, et prope Spring Garden," June-July, 1848, *Rugel 191* (NYB); scrub near Weekiwachee Spring, April 22, 1922, *Small 10413* (GH); sand hills west of Avon Park, De Soto Co., May 1, 1919, *Small & De Winkeler 9085* (NYB); oak ridge between Suwannee River and Trenton, April 28, 1924, *De Winkeler & Mosier 11328* (NYB); scrub between Perry and the Gulf of Mexico, near the mouth of Spring Warrior River, July 13, 1924, *Small, Small & De Winkeler 11453* (NYB); dry pine land, Gainesville, July 1, 1935, *West* (MBG); borders of swampy lake 20 mi. north of Tampa, June 17, 1939, *Woodson & Schery 115* (MBG).

**6. *B. LeContei* Torr. & Gray, forma *robustior* Larisey, f. nov.<sup>23</sup>**

*B. LeContei* Torr. & Gray ex Chapman, Fl. South. U. S., ed. 1, 111, 1860, ed. 2, 1889, and ed. 3, 1897, in part.

*B. LeContei* var.  $\beta$  Torr. & Gray, Fl. N. Am. 1: 387. 1840.

As the species except: stem stout; leaflets obovate, 4-5 cm. long, 2.5-3 cm. broad; stipules 0.6-1.4 cm. long, 1-3 mm. broad; petioles 6 mm. long; racemes subtended by simple, stipulate leaves; bracts 2 cm. long, 1 cm. broad, bracteoles 1 cm. long, 0.3 cm. broad; standard 1.2 cm. high, wings and keel 1.4 cm. long.

Distribution: western Florida.

**CITATION OF SPECIMENS:**

FLORIDA: Marianna, coll. of 1838, ex *Herb. Chapman* (NYB,TYPE).

<sup>23</sup> Ab specie differt ramis crassis; foliolis obovatis 4-5 cm. longis 2.5-3.0 cm. latis, stipulis 6-14 mm. longis 1-3 mm. latis, petiolis 6 mm. longis; racemis basi foliis simplicibus stipulatis subtendentibus; bracteis 2 cm. longis 1 cm. latis, bracteolis 1 cm. longis 0.3 cm. latis; vexillo 1.2 cm. alto, alis carinaque 1.4 cm. longis.

7. *B. calycosa* Canby in Bot. Gaz. 3: 65. 1878; Chapman, Fl. South. U. S., ed. 3, 122. 1897; Small, Fl. Southeast. U. S., ed. 1, 598. 1903, and ed. 2, 598. 1913; Small, Man. Southeast. Fl. 678. 1933.

Plant usually less than 1 m. high, blackening in drying, glaucous; stems slender, firm, glabrous, diffusely branched, branches usually straight, sometimes slightly geniculate; leaves short-petiolate, petioles 1–3 mm. long, leaflets spatulate, oblanceolate to narrowly cuneate, sparsely pubescent, 1–3 cm. long, 0.8–1 cm. broad; stipules elliptic or lanceolate, foliaceous, 1–2 cm. long, 3–5 mm. broad; racemes terminal, loose, usually straight, occasionally flexuous, rarely geniculate, 1–2 dm. long; pedicels slender, 3–4 cm. long, subtended by ovate-lanceolate bracts 1.5–1.8 cm. long, 5–8 mm. broad, bibracteolate above the middle, bracteoles 1.5 cm. long, 5 mm. broad, bracts and bracteoles foliaceous, persistent; calyx-tube short, 2–3 mm. deep, all five lobes foliaceous, sparingly ciliate, upper two united about half their length, remaining three ovate, obovate, or occasionally lanceolate, four times the length of the tube, 1–1.2 cm. long, 5–6 mm. broad; corolla yellow, scarcely surpassing the calyx-lobes, standard suborbicular, 1 cm. high, 1 cm. broad, wings and keel 1.2 mm. long; ovary glabrous, mature pod black, firm, reticulate, body broadly ovoid, 1 cm. long, barely exceeding the calyx, short-stipitate, short- and slender-beaked, beak slightly recurved.

Distribution: pine lands, eastern Florida.

CITATION OF SPECIMENS:

FLORIDA: near St. Augustine, *Floyd* (NYB); pine barrens, St. Augustine, *Floyd* (GH); sandy barrens, east Florida, 1878, *Floyd ex Herb. Canby* (MBG); dry pine barrens, July 1877, *Reynolds* (MBG, TYPE, USN, GH); pine barrens, east Florida, July 1878, *Reynolds* (NYB); dry pine-oak woods south of Green Cove Springs, July 14, 1935, *West* (MBG); dry pine-oak woods, Penny Farms, July 14, 1935, *West* (MBG).

8. *B. hirsuta* Small, Fl. Southeast. U. S., ed. 1, 598, 1331. 1903, and ed. 2, 598. 1913; Small, Man. Southeast. Fl. 676. 1933.

*B. calycosa* Canby var. *villosa* Canby in Bot. Gaz. 12: 39. 1887, not *B. villosa* (Walt.) Nutt.



Plant 0.3–1 m. high, hirsute throughout, with stiff, erect, ferruginous hairs, not blackening in drying, assuming reddish-brown cast; stems stout, diffusely branched, branches straight; leaves petiolate, petioles 3–8 mm. long, leaflets obovate, spatulate to narrowly cuneate, obtuse or apiculate, 1–3 cm. long, 0.8–1.2 cm. broad; stipules oblanceolate or oblong, elliptic, 1–1.5 cm. long, 3–5 mm. broad; flowers disposed in intercalary racemes, 7–20 cm. long, or occasionally in short terminal racemes; pedicels slender, 3–4 cm. long, subtended by foliaceous, ovate, elliptic bracts 1.5–2 cm. long, 5–9 mm. broad, bibracteolate above the middle, bracteoles lanceolate to narrowly elliptic, 1–1.2 cm. long, 2–3 mm. broad, bracts and bracteoles foliaceous, persistent; calyx-tube short, 2–4 mm. deep, lobes foliaceous, lanceolate, spatulate, rarely obovate, mucronate or apiculate, four times the length of the tube, 0.8–1.2 cm. long, 3–4 mm. broad, upper two united about half their length; corolla yellow, usually distinctly surpassing the calyx-lobes, standard suborbicular, slightly emarginate, 0.9–1.2 cm. high, 0.9–1.0 cm. broad, wings and keel 1–1.3 cm. long; ovary hirsute, mature pod brownish-black, pubescent, finely reticulate, body broadly ovoid, 1–1.3 cm. long, usually surpassing the calyx-lobes, long-beaked.

Distribution: dry sandy pine lands, western Florida.

CITATION OF SPECIMENS:

FLORIDA: high pine land near Crestview, May 22, 1930, *Blanton 6573* (MBG, USN, FM); dry pine woods, Walton Co., "De Funiak Springs, Wilson Co.," northwestern Fla., *Curtiss 699* (MBG, TYPE, USN, NYB, FM, UM, UN); dry pine barrens, De Funiak Springs, June 21, 1897, *Curtiss 5899* (MBG, USN, GM, NYB, FM, UM, UN, KA, UF); dry pine barrens, Crestview, May 11, 1898, *Curtiss 6406* (MBG, USN, GH, NYB, UM, UN); pine barren, De Funiak Springs, May 8, 1892, *Mohr* (USN); flat woods, De Funiak, July 1896, *Rolfs 676* (MBG, FM, UF); De Funiak, May 18, 1906, *Tracy 9100* (MBG, USN, GH, FM, WU, UM, UN).

9. *B. lanceolata* (Walt.) Ell. Sketch Bot. S. Car. & Ga. 1: 467. 1821; DC. Prodr. 2. 100. 1825; Torr. & Gray, Fl. N. Am. 1: 383. 1840; Chapman, Fl. South. U. S., ed. 1, 111. 1860, ed. 2, 111. 1889, and ed. 3, 121. 1897; Small, Fl. Southeast. U. S., ed. 1, 599. 1903, and ed. 2, 599. 1913; Small, Man. Southeast. Fl. 676. 1933.

*B. uniflora* (Michx.) Nutt. Gen. N. Am. Pl. 1: 281. 1818; Spreng. Syst. 2: 347. 1825.

*Sophora lanceolata* Walt. Fl. Car. 135. 1788.

*Podalyria uniflora* Michx. Fl. Bor. Am. 1: 263. 1803; Pursh, Fl. Am. Sept. 1: 307. 1814.

*Lasinia reticulata* Raf. New Fl. N. Am. 2: 48. 1836 [1837].

Plant less than 1 m. high, minutely appressed-pubescent throughout, pubescence whitish, pale yellow to tawny; stem slender, firm, lightly ribbed, widely branched, main stem remaining distinct and erect, branches slightly geniculate, ascending-spreading; leaves subsessile to short-petiolate, petioles 2-4 mm. long; leaflets occasionally subsessile, more frequently short-petiolulate, petiolules 2-5 mm. (rarely 1 cm.) long; blades firm, reticulate, yellow-green, somewhat glossy above, glaucous below, blackening, 5-8 cm. long, 1-1.5 cm. broad, usually lanceolate, oblanceolate, spatulate, occasionally narrowly elliptic, always tapering toward the base, rounded, retuse or mucronate at apex, rarely acuminate; stipules triangular, lanceolate, setaceous, always minute, caducous; flowers single in axils of upper leaves, or in few-flowered racemes terminating the branches; pedicels 4-7 mm. (rarely 1 cm.) long, stout; calyx-tube 6-9 mm. deep, upper lip cleft about 1 mm., lobes of the lower lip deltoid, 2-3 mm. deep; corolla yellow, standard notched, 1.5-7 cm. high, 1.2-4 cm. broad, wings and keel 2-2.2 cm. high; ovary densely white- or tawny-pubescent; mature pod usually glabrate, woody, dark brown or black, subglobose or ovoid, 0.9-1.3 cm. broad, 1.5-2.2 cm. long, stipe exceeding the calyx 1-2 mm., long- and slender-beaked.

Distribution: dry sandy hills and pine barrens, Georgia, Florida, and Alabama.

CITATION OF SPECIMENS:

GEORGIA: Tebeauville, April 1869, *Canby* (MBG,GH,NYB,FM); dry ground, Jesup, July 11, 1901, *Curtiss 6840* (MBG,USN,GH,NYB,UM,UN,KA); no definite locality, 1884, *Harden* (ANSP); dry pine barrens near Covena, Emanuel Co., April 5, 1904, *Harper 2095* (MBG,USN,GH,NYB); Vidalia, April 1914, *Huger* (MBG); Wayne Co., June 1893, *Kearney* (OU); no definite locality, *LeConte* (ANSP); dry pine barrens 4 mi. west of Folkston, Charlton Co., April 12, 1936, *Leeds 2559* (NYB,FM); sandy roadside  $6\frac{1}{2}$  mi. south of Irwinville, Irwin Co.,

Mar. 19, 1938, *Pyron & McVaugh 2122* (MBG); weed of sandy roadside 1 mi. south of Pelham, Mitchell Co., Mar. 21, 1938, *Pyron & McVaugh 2289* (MBG); dry sand hills 1 mi. south of Butler, Taylor Co., Mar. 22, 1938, *Pyron & McVaugh 2270* (MBG); pine barrens, Jesup, April 1893, *Euth* (MBG,OU); common on drier upland sand ridges, usually in cut-over pine woods and pastures, Tift Co., May 15, 1935, *Stephens* (MBG).

FLORIDA: sandy woods 5 mi. north of Calhoun, Duval Co., Mar. 24, 1938, *Buchanan Jr.* (MBG); no definite locality, *Chapman* (USN); Apalachicola, July 1878, *Chapman* (FM); dry sandy pine land, De Land, *Harkness* (MBG); McClenny, Feb. 1887, *Heading* (UM); road to Lanark, 3 mi. west of Ochlockonee River, Franklin Co., May 29, 1935, *Kurs* (MBG); McClenny, Baker Co., April 4, 1898, *Lighthipe 565* (MBG,UM,UW); common, dry sandy pine woods, Green Cove Springs, Mar. and April, *Mohr* (USN); dry sandy pine land, McIntyre Co., May 4, 1930, *Moldenke 1130* (MBG,USN,NYB,DU); dry pine barrens, St. Augustine, Mar. 1878, *Reynolds* (MBG,USN,NYB,FM,OU); dry pine barrens, St. Augustine, early summer, 1880, *Reynolds* (MBG,NYB); dry pine barrens at head of Pellicier's Creek, St. Johns Co., Mar. 2, 1882, *Smith 447* (USN,FM); along roadside between Tamaco River Bridge and Ormond, Mar. 26, 1937, *Springer* (UF); Port Orange, Mar. 26, 1895, *Straub 79* (GH); dry pine-oak woods south of Green Cove Springs, July 14, 1935, *West* (MBG); dry pine-oak woods, Penny Farms, July 14, 1935, *West* (MBG).

ALABAMA: dry pine ridges, eastern shore, Mobile Bay, May 1880, *Mohr* (FM).

**10. *B. elliptica*** Small, Fl. Southeast. U. S., ed. 1, 599, 1331. 1903, and ed. 2, 599. 1913; Small, Man. Southeast. Fl. 676. 1933.

*B. lanceolata* (Walt.) Ell. var.  $\beta$  Torr. & Gray, Fl. N. Am. 1: 384. 1840.

*B. lanceolata* (Walt.) Ell. ex Chapman, Fl. South. U. S., ed. 1, 111. 1860, ed. 2, 111. 1889, and ed. 3, 121. 1897, in part.

Plant usually less than 1 m. high, minutely tawny appressed-pubescent throughout; stem firm, ribbed, widely subdichotomously branched, branches strongly geniculate forming 135-degree angles; leaves usually sessile to short-petiolate, but petioles of the lower leaves sometimes 0.7–1 cm. long; leaflets petiolate, petioles 0.4–1 cm. long; blades firm, reticulate, glossy and blackening above, remaining dull and deep green below, 2–4 cm. broad, 8–13 cm. long, regularly narrowly to broadly elliptic, always tapering toward each end, more pronouncedly toward the base, but abruptly rounded, retuse or slightly mucronate, rarely acuminate at the apex, widest part usually just above the middle; lower leaflets occasionally lanceolate, upper ones rarely obovate-cuneate; stipules rarely lanceolate, 6 mm. long, subpersistent, usually setaceous, minute, caducous; flowers single in axils of upper leaves or in few-flowered

racemes terminating the branches; floral bracts narrowly lanceolate to setaceous, caducous; pedicels 2–7 mm. (rarely 7 mm.) long, stout; calyx-tube conspicuously nerved, 0.7–1 cm. deep, upper lip cleft 1 mm. but not usually separating, lobes of lower lip deltoid, 3 mm. deep, 3–4 mm. wide at mouth of tube, notch frequently broadly curved rather than angled; corolla yellow, standard deeply notched, 1.8 cm. high, 1.7 cm. broad, wings and keel 2.5 cm. high, 1 cm. broad; ovary densely tawny-pubescent; mature pod glabrate or with remains of tawny pubescence, brownish-black, woody, ovoid to oblong, body 2 cm. long, 1–1.3 cm. broad, short-stipitate, stipe not exceeding the firm, persistent calyx, long-beaked.

Distribution: dry sandy pine lands, Florida and adjacent Georgia, and Alabama.

CITATION OF SPECIMENS:

GEORGIA: no definite locality, *Boykin* (ANSP).

FLORIDA: no definite locality, *Chapman* (GH,FM); middle Florida, *Chapman* 190 (NYB); Apalachicola, *Chapman* (MBG); no definite locality, "*Chapman* mis. 1846" (MBG); Aspalaga, April 1898, *Chapman* (MBG); Quincy, *Chapman* (USN, ANSP); dry sandy soil near Apalachicola, April, *Curtiss* 639 (NYB,TYPE, MBG, USN,GH,ANSP,FM,UM); swamps, Walton Co., summer 1885, *Curtiss* (NYB); Apalachicola, 1892, *DeVasey* (USN); dry pine barrens, 5 mi. south of Tallahassee, Leon Co., April 1, 1933, *Griscom* 13393 (GH); southwest Leon Co., July 21, 1924, *Handley* A-147 (USN); 20 mi. above mouth of Apalachicola River, May 5, 1926, *Howell* 1165 (USN); dry pine land, Gretna, April 18, 1930, *Kincaid & West* (MBG); "in pinetia, inter Tallahassee et Quincy, Mai 1843," *Eugel* (MBG,NYB); dry pine barrens, Apalachicola, *Saurman* (ANSP).

ALABAMA: in high pine land, Atmore, April 17, 1935, *Blanton* 263 (GH,NYB, FM); dry sandy pine woods, Baldwin Co., May 1879, *Mohr* (USN).

11. *B. elliptica* Small var. *tomentosa* Larisey, var. nov.<sup>24</sup>

As the species except: more pubescent throughout, but especially on the lower leaf surfaces, forming a dense, tawny, felt-like mat; leaflets more nearly acuminate, smaller, 7–9 cm. long, 2–3.5 cm. broad; flowers smaller, calyx 7–8 mm. deep, standard 1.3–5 cm. high, wings and keel 1.8–2 cm. high, rarely slightly larger.

<sup>24</sup>Ab specie differt omnino pubescentiore; foliis infra dense fulvo-tomentosis; foliolis fere acuminatis 7–9 cm. longis, 2.0–3.5 cm. latis; floribus minoribus, calyce 7–8 mm. alto, vexillo 1.3–5.0 cm. alto, alis carinaque 1.8–2.0 cm. longis raro maioribus.

Distribution: dry sandy pine lands, Florida and adjacent Alabama.

CITATION OF SPECIMENS:

FLORIDA: dry soil near Pensacola, April 13, 1899, *Biltmore Herb. 1595f* (MBG, NYB); dry pine land, Okaloosa, April 3, 1929, *Blackman & Enlow* (MBG); open pine woods near DeFuniak Springs, April 27, 1898, *Curtiss 6379* (MBG,TYPE, USN, GH,NYB,UM,UN); Lake City, *Rolfs 85* (MBG,FM); De Funiak, July 1896, *Rolfs 671* (MBG).

ALABAMA: pinelands, Loxley, June 22, 1933, *Bombard & Haas* (TU); Baldwin Co., May 1893, *Mohr* (MBG).

12. *B. Nuttalliana* Small, Fl. Southeast. U. S., ed. 1, 599. 1903, and ed. 2, 599. 1913; Cocks, The Leguminosae of Louisiana. La. State Mus. Nat. Hist. Surv. Bull. 1: 5, pl. 6. 1910.

*B. uniflora* Hook. Comp. Bot. Mag. 1: 21. 1835, not *B. uniflora* (Michx.) Nutt.

*B. lanceolata* (Walt.) Ell. var.  $\gamma$  Torr. & Gray, Fl. N. Am. 1: 384. 1840. (var. *uniflora* of authors).

*B. lanceolata* var. *uniflora* Torr. & Gray ex Canby in Bot. Gaz. 4: 131. 1879.

*B. lanceolata* var. *texana* Holz. in Contr. U. S. Nat. Herb. 1: 286. 1893.

*B. texana* (Holz.) Pollard & Ball in Proc. Biol. Soc. Wash. 13: 133. April 1900, not *B. texana* Buckl.

*B. confusa* Pollard & Ball in Proc. Biol. Soc. Wash. 13: 158. June 1900, not *B. confusa* Sweet.

*B. nuculifera* Greene, Leaflets Bot. Obs. 2: 84. 1910.

Plant 4–11 dm. high, more or less densely pubescent throughout, occasionally glabrate in age, slightly blackening; stem slender, firm, much-branched, branches usually geniculate, ascending; leaves sessile to subsessile, petioles not usually exceeding 1 mm. in length; leaflets firm, reticulate, glossy above, dull below, oblong to obovate, cuneate at base, obtuse to rounded at apex, frequently emarginate, occasionally apiculate, 2.5–3.5 cm. long, 1.3–2 cm. broad, lateral leaflets converging; stipules deltoid, deltoid-lanceolate to setaceous, inconspicuous, usually caducous; flowers solitary in upper axils, or forming short terminal racemes; floral bracts narrowly lanceolate to setaceous, 2–4 mm. long, caducous; pedicels 2–5 mm. long; calyx-tube 7–9 mm. long, hirsute, deeply blackening, upper lip en-



tire, barely cleft or distinctly emarginate, lobes of the lower lip deltoid or deltoid-lanceolate, apiculate, 3-4 mm. deep; corolla yellow, standard 0.8-1.5 cm. long, 0.6-1.2 cm. broad, wings and keel 1.7-2 cm. long; ovary thickly pubescent, mature pod somewhat glabrate, though usually more or less villous, blackish, coriaceous to ligneous, thick, subglobose to ovoid, 0.4-1.3 cm. long, 0.2-1.1 cm. thick, stipe not exceeding the calyx-lobes, beak short, recurved.

Distribution: Mississippi to Arkansas and Oklahoma, southwest to Texas; reported from adjacent Mexico.

CITATION OF SPECIMENS:

MISSISSIPPI: Madison, April 28, 1925, *Cook* (USN); Ridgeway, April 18, 1927, *Woodson & Anderson 1538* (MBG).

LOUISIANA: in pine hills in vicinity of Alexandria, June 3, 1899, *Ball 546* (USN, TYPE of *B. confusa* Pollard & Ball, MBG, NYB, GH, FN, UN); prairie along R.R. 3 mi. west of Lawtell, St. Landry Parish, April 26, 1936, *Brown 6253* (LU); along R.R. north of Roark, Acadia Parish, April 26, 1936, *Brown 6267* (LU); rare, pine-oak-hickory woods southeast of Columbia, Caldwell Parish, June 24, 1936, *Brown 6489* (LU); common in pine-hardwood woods southeast of Jena, Catahoula Parish, June 26, 1936, *Brown 6533* (LU); open pastures, Shreveport, April 13, 1910, *Cocks 1630* (TU); open fields, Shreveport, April 15, 1910, *Cocks* (MBG); Natchitoches, April 2, 1911, *Cocks* (TU); Shreveport, July 1909, "*Dickson & Cocks 1791*" (MBG); Calcasieu Parish, *Featherman* (LU); no definite locality, *Hale* (GH); in prairies, Opelousas, April 1880, *Langlois* (NYB, FM); in plains, Calcasieu Co., April 26, 1884, *Langlois 8* (NYB); in plains, Chataignier, St. Landry Co., May 12, 1885, *Langlois 7* (NYB); in prairie, Tokataite, Opelousas, May 20, 1885, *Langlois 29* (USN); Chataignier, June 21, 1885, *Langlois* (NYB); dry open woods, Natchitoches, May 10, 1915, *Palmer 7570* (MBG); low prairies, Jennings, Jefferson Davis Parish, May 15, 1915, *Palmer 7631* (USN); dry sandy highland, cut-over pine land, Pineville, Rapides Parish, April 3, 1935, *Smith 93* (LU); Shreveport, Aug. 4-6, 1897, *Tracy 3450* (MBG, USN).

ARKANSAS: common in pine woods, Fulton, May 12, 1900, *Bush 214* (MBG, USN, GH); common on prairie, Prescott, May 14, 1900, *Bush 264* (USN); prairies, Fulton, April 29, 1909, *Bush* (MBG); dry sand hills north of Texarkana, Miller Co., June 9, 1898, *Eggert* (MBG); open woods near Fort Smith, June 1835, *Engelmann 1002* (MBG); Camden, May 10, 1850, *Fendler* (MBG, GH); Malvern, May 1884, *Letterman* (MBG); Prescott, *Letterman* (MBG); no definite locality, *Nuttall* (NYB, ANSP); rocky ground along small stream near Mansfield, Sebastian Co., May 24, 1931, *Palmer 39303* (MBG, GH); dry woods on high bluff on Ouachita River about 1 mi. above Arkadelphia, Clark Co., May 18, 1912, *Wheeler* (MBG, FM); dry woods near Arkadelphia, Clark Co., May 1913, *Wheeler* (MBG, FM).

OKLAHOMA: open place, mountain side near Page, Le Flore Co., June 20, 1914, *Blakley 1428* (MBG, GH, UM); Pine Valley, Le Flore Co., May 4, 1935, *Goodman 2359* (MBG); common, open woods, Shawneetown, McCurtain Co., May 26, 1916, *Houghton 3800* (MBG).



TEXAS: Hughes Springs, Cass Co., May 9, 1903, *Biltmore Herb. 14783a* (MBG, USN,UM); common on prairie, Sulphur, May 11, 1900, *Bush 207* (USN); 6 mi. southwest of Oakwood, Leon Co., May 11, 1937, *Cory 21741* (MBG); 9 mi. northwest of Jefferson, Marion Co., May 19, 1937, *Cory 22836* (MBG); open woods, old fields, etc., San Augustine, *Crocket* (USN); Huntsville, June 3-12, 1908, *Dixon 64* (FM); Walker Co., May 6-12, 1910, *Dixon 525* (USN,FM); vicinity of Houston, Harris Co., May 22-June 12, 1910, *Dixon 607a* (FM); Troupe, Smith Co., April 19, 1899, *Eggert* (MBG); Spring, May 4, 1924, *Fisher* (DU); Shiro, Mar. 12, 1934, *Fisher 34104* (FM); Houston, 1914 *Hayden* (GH); Mansfield, Tarrant Co., May 1927, *Killian* (UT); Dalby, May 4, 1896, *Milligan* (USN); no definite locality, coll. of 1889, *Neally 71* (USN); no definite locality, coll. of 1889, *Neally 73* (USN, TYPE of *B. lanceolata* var. *texana* Holz.); sandy knolls, prairies, Columbia, Brazoria Co., April 12, 1914, *Palmer 5213* (MBG,USN); Arlington, May 1880, *Reverchon* (MBG); sandy woods, Dallas Co., June 1881, *Reverchon 11* (GH); sandy woods, Dallas, June 1882, *Reverchon 184* (MBG); common in sand, Big Sandy, May 27-28, 1901, *Reverchon 2652* & *2654* (MBG); sandy soils, Beaumont Co., April 25, 1903, *Reverchon 3759* (MBG); woods in Angelina Bottom, Angelina Co., May 7, 1903, *Reverchon 3740* (MBG); sandy woods 5 mi. from Polytechnic, Tarrant Co., April 22, 1921, *Ruth 62* (FM,UW,KA); in sandy woods near Polytechnic, Tarrant Co., April 27, 1925, *Ruth 621* (USN); Palestine, April 14, 1929, *Tharp 5420* (USN, UT); Montgomery Co., April 19, 1930, *Tharp* (UT); Henderson Co., June 6, 1932, *Tharp* (UT); Walker Co., July 9, 1920, *Warner 12* (USN,UT); Nacogdoches, June 15, 1931, *Whitehouse* (UT); abundant, dry, open ground near Gallatin, Cherokee Co., April 10, 1916, *Young* (GH,UT).

### 13. *B. intercalata* Larisey, sp. nov.<sup>25</sup>

Plant less than 1 m. high, finely pubescent throughout, often glabrate in parts; stem somewhat stout, firm, ribbed, slightly

<sup>25</sup>Herba vix 1 m. alta omnino molliter pubescens saepe plus minusve glabrata; caules crassiusculi firmi striati paulo geniculati late ramosi, ramis erectis raro paululo geniculatis sat elongatis virgatis glabratiss. Folia inferiora brevi-petiolata, superiora subsessilia, foliolis obovatis vel ellipticis apice obtusis rotundatisve saepe emarginatis basi cuneatis 4-6 cm. longis 1.7-2.2 cm. latis firme membranaceis reticulato venosis supra saturate viridibus illustribus paulo nigrescentibus subtus opacis sat glaucis saepe glabratiss marginibus nervo medio basi excepto, stipulis deltoideis aut deltoideo- aut ovato-lanceolatis 3-8 mm. longis persistentibus. Racemi intercalati 1.5-2.0 dm. longi, bracteis lanceolatis vel ovato-lanceolatis 0.8-1.2 cm. longis, 2-3 mm. latis persistentibus, pedicellis 0.9-1.3 cm. longis. Corolla lutea, vexillo 1.6 cm. longo et lato, alis et carina patulis inaequilateralibus auriculatis 2.0-2.2 cm. longis 7-8 mm. latis. Calycis tubum 7-9 mm. longum conspicue nervatum nigrescens extus sparse intus dense luteo-pubescens, labro superiore integro 4-5 mm. longo basi 5-6 mm. lato apice obtuse apiculato vel truncato usque ad 1 mm. lato, labri inferiori lobis deltoideis vel deltoideo-lanceolatis 3-4 mm. longis basi 2.5-3.0 cm. latis. Legumen subglobosum inaequilaterale longe stipitatum in rostrum paulo recurvatum gradatim contractum 1.5-7.0 cm. longum, 1.6-1.9 cm. latum tenue sed solidum juventate conspicue inflatum maturitate in rugas profundas corrueus nigrescens valde reticulatum pubescens.

geniculate, widely branched, branches erect, only rarely lightly geniculate, elongate, virgate, glabrate; leaves subsessile above, lowermost petiolate, petioles 1-4 mm. long; leaflets firm, reticulate, glossy, dark green, slightly blackening above, dull, grayish below, usually glabrate except along the margins and midvein toward the base, obovate to elliptic, cuneate, apex obtuse to rounded, frequently emarginate, 4-6 cm. long, 1.7-2.2 cm. broad; stipules deltoid, deltoid-lanceolate, ovate-lanceolate, 3-8 mm. long, persistent; flowers borne in intercalary racemes 1.5-2 dm. long; floral bracts lanceolate to ovate-lanceolate, 8-12 mm. long, 2-3 mm. broad, persistent; pedicels 0.9-1.3 cm. long; corolla yellow, standard 1.6 cm. high, 1.6 cm. broad, wings and keel strongly curved, inequilateral, auriculate, 2-2.2 cm. high, 7-8 mm. broad; calyx-tube conspicuously nerved, blackening, finely pubescent without, densely tawny-pubescent within, 7-9 mm. long, upper lip entire, obtusely apiculate or truncate, blunt tip up to 1 mm. across, base 5-6 mm. across, 4-5 mm. deep, lobes of lower lip deltoid to deltoid-lanceolate, 3-4 mm. deep, base 2.5-3 mm. across; pod thin but firm, much inflated but collapsing at maturity into deep folds, black, strongly reticulate, pubescent, 1.5-7 cm. long, 1.6-1.9 cm. broad, subglobose, inequilateral, long-stipitate, long-beaked, beak slightly recurved.

Except for the unique manner in which the flowers are borne, this species bears a close superficial resemblance to *B. Nuttalliana* Small. It may possibly be a hybrid between the latter and *B. leucophaea* Nutt., but at present there is no concrete evidence for this assumption.

Distribution: prairies, western Louisiana.

CITATION OF SPECIMENS:

LOUISIANA: in prairies, Calcasieu, April 26, 1884, *Langlois* (NYB,TYPE); in plains, Calcasieu Co., April 26, 1884, *Langlois* (NYB); plains, Chataignier, St. Landry Co., May 19, 1885, *Langlois* (NYB).

14. *B. bracteata* Muhl. ex Ell. Sketch Bot. S. Car. & Ga. 1: 469. 1821; DC. Prodr. 2: 100. 1825; Small, Fl. Southeast. U. S., ed. 1, 600. 1903, and ed. 2, 600. 1913; Small, Man. Southeast. Fl. 677. 1933.

*B. leucophaea* Nutt. ex Chapman, Fl. South. U. S., ed. 1, 112. 1860, ed. 2, 112. 1889, and ed. 3, 122. 1897, in part.

*B. saligna* Greene, Leaflets Bot. Obs. 2: 84. 1910.

*Podalyria bracteata* Muhl. Cat. Pl. Am. Sept. 42. 1815, *nomen subnudum*.

*Lasinia bracteata* Raf. New Fl. N. Am. 2: 50. 1836 [1837].

Plant 3-6 dm. high, more or less softly and loosely pubescent throughout, darkening but not blackening in drying; stem stout, ribbed, subdichotomously branched, branches divaricate; leaves petiolate, petioles 0.3-1.2 cm. long, leaflets firm, oblanceolate to obovate or elliptic-obovate, cuneate, apex acute or obtuse, 5-10 cm. long, 2-3.5 cm. broad, lower surface finely reticulate at maturity; stipules wide-subulate, acuminate, 2-4 cm. long, persistent; racemes axillary, 1-2 dm. long, secund, declined; floral bracts lanceolate to ovate-lanceolate, 1-3 cm. long, persistent; pedicels 1-1.5 cm. long; calyx-tube 1 cm. deep, upper lip emarginate or distinctly 2-lobed, lobes of the lower lip deltoid-ovate, 4-5 mm. long; corolla cream or yellow, standard 1.8-2 cm. high, 1.5-1.7 cm. broad, wings and keel 2.2-2.5 cm. long; pods ligneous, body elliptic, 3-4 cm. long, 1.5-1.7 cm. broad, sparsely subappressed-pubescent, slightly reticulate, gradually tapering into a slender beak, stipe equalling the calyx in length.

Distribution: dry sandy woods, North Carolina, south to Georgia and Alabama.

CITATION OF SPECIMENS:

NORTH CAROLINA: no definite locality, *Curtis* (NYB); vicinity of Wilmington, April 14-17, 1911, *Bartram & Long* (ANSP).

SOUTH CAROLINA: Columbia, May 9, 1899, *Canby & Sargent 20* (GH); dry sandy soil, Anderson, Aug. 4, 1919, *Davis 9142* (MBG); Morehead's woods near Anderson, May 4, 1920, *Davis 1315a* (MBG,USN); dry open woods, Anderson, May 4, 1920, *Davis 1315b* (UT); Watson's woods, Anderson, Anderson Co., May 4, 1920, *Davis 1315c* (MBG,UM,UT); Columbia, April 14, 1867, *Doggett* (UW); Anderson, *Gibbes* (NYB); dry woods near Seneca River, Clemson College, Oconee Co., April 18, 1906, *House 1862* (MBG); vicinity of Batesburg, Lexington Co., April 29, 1911, *McGregor 25* (USN); sandy open woods near Irmo, Lexington Co., April 19, 1932, *Palmer 39958* (MBG,GH); Aiken, 1880, *Ravenel* (USN); Aiken, April 7, 1888, *Smith* (ANSP); woods, Columbia, June 1891, *Taylor* (UM); dry open woods in clayey soil northwest of Saluda, April 27, 1932, *Weatherby 6140* (NYB,USN,GH).

GEORGIA: Wrightsboro, *Chapman* (NYB); in open oak woods, Augusta, April 24, 1900, *Cuthbert 179* (NYB); dry open woods, Augusta, April 29, 1902, *Cuthbert* (UF); dry woods, Athens, April 1897, *Harper* (NYB); Winterville, April 22, 1925, *Maguire 53379* (UG); Oconee Heights, Clarke Co., April 25, 1923, *Miller 53383* (UG); Madison Springs, *Ravenel* (GH); Athens, April 15, 1910, *Rice & East 53391* (UG); in oak woods, head of Cloverhurst, Athens, April 25, 1928, *Reade 53381* (UG); oak woods, Experiment, April 25, 1899, *Riegel* (KA); "in montibus supra Casseville, Ga. sup., April 1845," *Eugel 190* (NYB); Tallapoosa, April & May, 1900, *Way 31* (USN, TYPE of *B. saligna* Greene); Royston, May 3, 1928, *Wherry* (NYB).

ALABAMA: dry cherty woods on south slope of Craig Mtn., Cherokee Co., June 22, 1936, *Harper 5528* (MBG, USN, NYB, GH); Talladega Mtns., June 26, 1911, *Howell 779* (USN).

**15. *B. leucophaea*** Nutt. Gen. N. Am. Pl. 1: 282. 1818; DC. Prodr. 2: 100. 1825, in part; Torr. & Gray, Fl. N. Am. 1: 385. 1840, in part; Chapman, Fl. South. U. S. ed. 1, 112. 1860, ed. 2, 112. 1889, and ed. 3, 122. 1897, in part; Curt. Bot. Mag. III, 27: pl. 5900. 1871; Small, Fl. Southeast. U. S., ed. 1, 601. 1903, and ed. 2, 601. 1913; Rydb. Fl. Prairies & Plains Central N. Am. 455. 1932.

*B. bracteata* (Muhl.) Ell. ex Britton & Brown, Illust. Fl. North. U. S., ed. 1, 2: 266, fig. 2052. 1897, and ed. 2, 2: 345, fig. 2456. 1913; Gray, New Man. Bot. ed. 7, 506. 1908.

*Lasinia bracteata* Raf. New Fl. N. Am. 2: 50. 1836 [1837].

Plant 3-8 dm. high, tawny-villous to woolly-tomentose throughout; stems stout, heavily ribbed, simply branched, branches divaricate; leaves subsessile to short-petiolate, petioles not usually more than 3 mm. long; leaflets oblanceolate, spatulate, or narrowly elliptic, apex acute, slightly apiculate, rarely retuse, 3-10 cm. long, 1-2 cm. broad, leathery, strongly reticulate, lateral leaflets more or less decurrent on the petioles; stipules ovate- to cordate-lanceolate, acuminate, foliaceous, 2-4 cm. long, persistent; racemes axillary, 1-2 dm. long, secund, declined; floral bracts ovate- to cordate-lanceolate, acuminate, 1-3 cm. long, persistent; pedicels slender, 1-4 cm. long; calyx-tube 1 cm. deep, strigillose, upper lip slightly emarginate to distinctly two-lobed, lobes of the lower lip deltoid-lanceolate, 3-4 mm. long; corolla white, cream, or yellow, standard 2.2 cm. high, 2 cm. broad, wings and keel 2.4-2.7 cm. long; mature pod ovoid-elliptic, 4-5 cm. long, 1.5-2.5 cm.

broad, firm, strongly reticulate, densely spreading-pubescent, short-stipitate, stipe not exceeding the calyx, body tapering gradually into a short and slender beak.

Hybridizes with *B. viridis* in Louisiana, Arkansas, and Oklahoma; with *B. sphaerocarpa* in Arkansas and Oklahoma; and with *B. minor* in Missouri, Kansas, and Oklahoma.

Distribution: open woods and prairies, Michigan and Indiana to Minnesota, southwest to Arkansas and Texas. Introduced along railroads in Massachusetts.

CITATION OF SPECIMENS:

MASSACHUSETTS: by RR. between Woods Hole and Falmouth, July 1922, *Taylor* (ANSP).

MICHIGAN: prairie, Kalamazoo Co., Aug. 1, 1838, *Wright* (NYB).

INDIANA: RR., Benton Co., May 20, 1929, *Barce, Barce & Welch 6126* (IU); open black- and pin-oak woods 0.5 mi. west of Crisman, Porter Co., July 10, 1920, *Deam 31,562* (GH, IU); dry roadside about 4 mi. southwest of Crown Point, Lake Co., July 12, 1920, *Deam 31,625* (CD); open flat black oak woods about 4 mi. southwest of Lake Village, Newton Co., July 13, 1920, *Deam 31,683* (CD); frequent along RR. right-of-way 1 mi. south of Wanatah, LaPorte Co., *Deam 36,708* (CD); roadside knoll 3.5 mi. southwest of Lowell, Lake Co., June 5, 1924, *Deam 40,522* (CD); right-of-way of Monon RR., 4 mi. south of Medarysville, Pulaski Co., June 7, 1924, *Deam 40,570* (IU); common in sandy soil on RR. right-of-way about 3 mi. west of Monticello, White Co., May 22, 1932, *Deam 51,926* (IU); frequent, wooded promontory on high bank of the Wabash River at Black Rock, about 3.25 mi. southeast of Greenhill, Warren Co., May 29, 1933, *Deam 53,840* (IU); rare, Jasper Co., June 12, 1924, *Welch 5858* (IU).

KENTUCKY: open woods and prairies near Paducah, McCracken Co., June 17, 1920, *Palmer 17928* (MBG); dry bank between Murray and Pine Bluff Ferry, Callaway Co., July 23, 1937, *Smith & Hodgdon 4197* (USN, NYB).

WISCONSIN: St. Croix Falls, Aug. 20, 1900, *Baker* (GH); low ground, Arena, Iowa Co., June 15, 1929, *Breakey* (UW); no definite locality, ex *Herb. Chapman* (NYB); hillside, 1 mi. south of Milton, Rock Co., May 30, 1930, *Fernholz & Wadmond* (UW); Madison, May 23, 1891, *Cheney* (UW); Blue Mounds, May 30, 1894, *Cheney* (UW); Friendship, Adams Co., July 21, 1927, *Davis* (UW); prairie hillside, Battle Mtn., De Soto, Vernon Co., July 23, 1934, *Fassett 17792* (UW); open sand and pine barrens north of Angelo, Monroe Co., July 25, 1934, *Fassett 16463* (UW); prairie summit of Bogus Bluff, Gotham, Richland Co., Aug. 11, 1934, *Fassett 16641* (UW); sand bank near Rising Sun, 7 mi. north of Mt. Sterling, Crawford Co., Aug. 12, 1934, *Fassett 17790* (UW); RR., Bangor, La Crosse Co., Sept. 10, 1934, *Fassett 17791* (UW); gravel hill, Sheridan, Waupaca Co., Sept. 15, 1934, *Fassett 16541* (UW); sandy roadside near Lemonweir, 3 mi. southeast of Mauston, Juneau Co., Sept. 17, 1934, *Fassett 16540* (UW); prairie relic, 3 mi. south of Livingston, Grant Co., Sept. 23, 1934, *Fassett 17793* (UW); sandstone ledge near Highway K, 3 mi. south of Mt. Ida, Grant Co., Sept. 17, 1935, *Fassett 17794* (UW); in sand, Camp Douglas, Juneau Co., Oct. 7, 1934, *Fassett & Bushnell 16565* (UW);



prairie relic, roadside, County Trunk Highway B, east of Tunnel City, Monroe Co., Oct. 7, 1934, *Fassett & Bushnell 16729* (UW); dry soil, Necedah Mound, Necedah, Juneau Co., May 22, 1932, *Fassett & Drescher 14217* (UW); sand dunes, Waumandee Terrace, Fountain City, Buffalo Co., Aug. 25, 1927, *Fassett & Wilson 4365* (UW); river bank, Janesville, Rock Co., May 24, 1931, *Hagen* (UW); Madison, coll. of 1861, *Hale* (MBG,UW); prairie, June 16, 1883, *Hasse* (NYB); Boscobel, June 1884, *Hasse* (NYB); thinly oak-covered, morainic "island" west of University Creek bridge, University Bay, Madison, May 30, 1908, *Heddle 1095* (UW); RR., northwest of Black Earth, Dane Co., Aug. 3, 1916, *Heddle 2504* (UW); rich wooded hillside 1.5 mi. southeast of Ithaca, Richland Co., June 10, 1912, *Lansing 3442* (38455) (UW); Milwaukee, *Lapham* (ANSP, UW); Beloit, June 1886, *Maxwell* (UW); sandy hillside, Leyden, Rock Co., May 30, 1928, *Mead* (UW); Kilbourn City, Columbia Co., June 10, 1901, *Meredith* (ANSP); Pine Bluff, Dane Co., May 28, 1929, *Oelmliller* (UW); La Crosse Co., July 16, 1887, *Pammel* (MBG); sandy soil, top of hill between Eau Claire and Chippewa Falls, July 9, 1915, *Rosendahl & Butters 3155* (UM); Poynette, June 6, 1890, *Russell* (UW); no definite locality, ex *Herb. Torrey* (NYB); Fairchild, Eau Claire Co., May 23, 1894, *Weinsirl* (UW).

ILLINOIS: Aurora, June 1881, *Bassett* (ANSP); prairies about Salem, May 1880, *Bobb* (ANSP); prairies north of Woodlawn, Jefferson Co., May 16, 1898, *Eggert* (MBG); dry soil along RR., Chillicothe, May 15, 1880, *Fisher* (KA); black oak association, Shirland, June 26, 1908, *Gleason* (GH); sand dunes, Bath, Aug. 14, 1913, *Gleason* (GH); prairies, Menard Co., 1861, *Hall* (USN); Troy Grove, June 3, 1893, *Hapeman* (UW); roadsides, Port Byron, June 22, 1892, *Harper* (UW); rare, dry prairies, Peoria, May 1894, *McDonald* (GH, NM); Augusta, April 1843 (1844-?), *Mead* (MBG,NYB,GH,ANSP); Romeo, May 9, 1896, *Merner 14864* (UW); rare, field south of Elmhurst, July, *Moffatt 148* (UM); uncommon, prairies near Chicago, Aug. 3, 1892, *Moffatt 646* (UW); sandy barrens near Oquawka, May 1875, *Patterson* (MBG,ND,UW); near Naperville, May 27, 1898, *Powell 17572* (UW); prairie, Kinkade's, Richland Co., Sept. 13, 1919, *Ridgway 909* (GH); prairies, Will Co., May 9, 1896, *Umbach* (MBG,ANSP,UM); prairies, Romeo, May 22 & July 26, 1897, *Umbach* (MBG,GH,UM); prairies, Lisle, May 19, 1900, *Umbach 11964* (UW).

MINNESOTA: St. Cloud, *Campbell* (ANSP); dry dunes, sand prairie, Weaver, Wabasha Co., Aug. 28, 1926, *Fassett & Hotchkiss 3436* (UM); dry soil, Winona Co., July 1886, *Holsinger* (UM); bluff slopes, Winona Co., June 1901, *Holsinger* (UM); Lake City, Sept. 1884, *Manning* (GH, UM); Spring Grove, June 3, 1902, *Rosendahl 289* (UM); Winnebago Valley, Houston Co., May 1901, *Wheeler 1054* (UM).

IOWA: prairie, Decatur Co., May 25, 1904, *Anderson* (MBG); Page Co., May 11, 1891, *Barkley* (MBG); dry prairies, Wesley, May 24, 1898, *Breithaupt 9286* (UW); low prairie, Black Hawk Co., June 6, 1929, *Burk 301* (MBG); along road to Moorland near Fort Dodge, Webster Co., May 29, 1904, *Churchill 2051* (UN); near Angus, Boone Co., May 19, 1904, *Churchill 2052a* (UN); near Carbon, Adams Co., May 23, 1905, *Churchill 2052b* (UN); dry prairie, Armstrong, Emmet Co., May 19, 1887, *Cratty* (MBG,USN); Vinton, *Davis* (UW); prairie, Fayette, May 14, 1894, *Fink* (GH, UM); Johnson Co., May 13, 1895, *Fitzpatrick & Fitzpatrick* (MBG); roadside west of Stockport, Van Buren Co., June 1924, *Graves 2114* (MBG); along RR., Cone City, Muscatine Co., May 1926, *Graves* (MBG); Elmyra,



*Hitchcock* (MBG); Iowa City, June 22, 1889, *Hitchcock* (KA); Grinnell, May 21, 1877, *Jones* (ANSP); thickets and open ground above limestone bluffs of Mississippi River near Keokuk, Lee Co., May 20, 1929, *Palmer 35866* (OH); New Albin, July 22, 1897, *Pammel 590* (MBG,USN,GH); Ames, May 1903, *Pammel* (GH); Emmet Co., July 1926, *Pammel & Fisk* (MBG); Davenport, coll. of 1848, *Parry* (NYB); Fort Dodge, May 29, 1909, *Somes 3095* (USN).

MISSOURI: Sedalia, April 30, 1925, *Archias 3* (MBG); on prairie, Jackson Co., May 8, 1864, *ex Herb. Broadhead* (MBG); common, Montier, May 15, 1894, *Bush 75* (MBG,ND); introduced, uncommon, Courtney, Jackson Co., May 25, 1896, *Bush 304* (MBG); prairies, Pettis Co., May 7, 1935, *Bush 14763* (MBG); rocky woods, Eagle Rock, May 9, 1936, *Bush 15386* (MBG); hillsides, Grundy Co., May 10, 1936, *Bush 7* (MBG); hillsides, Grundy Co., May 10, 1936 *Cruikshanks 7* (MBG); dry prairies, La Grange Co., May 9, 1912, *Davis 1323* (MBG); dry open woods, McCune Station, Pike Co., May 20, 1919, *Davis 4401* (MBG,UM); Carson, Howell Co., June 27, 1878, *Eggert* (MBG); Kirkwood, St. Louis Co., May 12, 1879, *Eggert* (MBG); "in Waldern," St. Louis Co., May 16, 1879, *Eggert* (MBG); open places, St. Louis Co., May 16, 1879, *Eggert* (GH); Missouri RR., north of Webster, St. Louis Co., May 16, 1879, *Eggert* (MBG); South Webster, St. Louis Co., June 21, 1887, *Eggert* (MBG); St. Louis, May 1843, *Engelmann* (MBG); siliceous hills of Washington Co., Nov. 1845, *Engelmann* (MBG); Allenton, May 23, 1892, *ex Herb. Glatfelter* (MBG); south slope, Shepard Mtn., Arcadia, Iron Co., May 26, 1918, *Greenman 3888* (MBG); Windsor Springs, June 13, 1891, *Hitchcock* (MBG); St. Louis, May, *James in Long's Expedition* (NYB); Allenton, July 17, 1884, *Kellogg* (MBG); open woods near RR., east of Mansfield, Ozark Mtns., June 5-12, 1911, *Lansing 3196* (USN,GH); Allenton, *Letterman* (MBG); Allenton, St. Louis Co., Aug. 13, 1933, *Lodewyks 41* (MBG); common on prairie, Waldo Park, Jackson Co., May 2, 1897, *Mackenzie* (UM); common, prairies, Hickman's Mills, Jackson Co., May 14, 1899, *Mackenzie 13184* (UW); St. Louis, *Nuttall* (ANSP,TYPE); along RR. between Greentop and Sublette, Adair Co., May 16, 1938, *Ownbey & Ownbey* (MBG); common on prairie, Webb City, Jasper Co., May 7, 1902, *Palmer 128* (MBG); open ground near river, Monticello, Lewis Co., June 26, 1933, *Palmer & Steyermark 40679* (MBG); wet prairies, St. Louis, April 1842, *Riehl 342* (NYB); along Mo. South. RR., Reynolds Co., May 2, 1908, *Smith 274* (UW); prairie northeast of Springfield, Aug. 21, 1912, *Standley 9129* (USN); dry upland glade 2 mi. southeast of Osage Hills, St. Louis Co., May 5, 1928, *Steyermark 933* (MBG); natural prairie between Caplinger Mills and Stockton, about 3 mi. north of Stockton, Cedar Co., July 13, 1934, *Steyermark 13421* (MBG); Rose Hill, May 8, 1887, *Wislizenus 725* (MBG); Shepard Mtn., Ironton, May 9, 1925, *Woodson 324* (MBG); Greene Co., April 28, 1888, *Weller* (MBG).

ARKANSAS: Fort Smith, 1853-4, *Bigelow* (NYB,USN); glades Carroll Co., May 9, 1936, *Bush 15376* (MBG); wooded sandstone hillside, Boston Mtns., Cass, Franklin Co., April 25, 1935, *Fassett 17364* (UW); scarce, dry hillsides, Fayetteville, May, *Harvey* (UM); dry prairies and hills, northwest Arkansas, May, *Harvey 7* (NYB); rocky hillsides, base of Rich Mtn., Polk Co., April 28, 1935, *Lodewyks 203* (MBG); open rocky hillsides, Eureka Springs, Carroll Co., May 12, 1914, *Palmer 5563* (MBG,USN); rocky open ground, near Hot Springs, Garland Co., April 13, 1924, *Palmer 24494* (MBG); rocky open woods, Sugarloaf Mtn., near Midway,

Sebastian Co., April 8, 1928, *Palmer 33276* (MBG); no definite locality, *Pitcher* (ANSP); Fayetteville, June 1925, *Watts* (UW).

NEBRASKA: near Lincoln, Lancaster Co., May 27, 1873, *Aughey* (UN); Lincoln, Lancaster Co., May 20, 1904, *Bates 3180* (GH,UM,UN); Valparaiso, Saunders Co., May 16, 1879, *Cleburne* (UN); prairies, Tecumseh, Johnson Co., May 1895, *Corson* (UN); frequent locally on prairie near Fremont, Dodge Co., May 1894, *Engberg* (UN); rich bottoms and upland prairies, Platte Valley 50 mi. above Monk, June 1857, *Hayden* (MBG); no definite locality, coll. of 1869, *Hayden* (ANSP); common on high prairie along RR., 5 mi. west of Lincoln, Lancaster Co., May 20, 1934, *Morrison 951* (MBG); Wahoo, Saunders Co., June 1890, *ex Herb. Rydberg* (UN); over whole prairie, flowering on south slope, May 12, 1927, *Steiger* (UN); Lincoln, Lancaster Co., May 1887, *Weber* (MBG,UN); Lincoln, Aug. 1898, *Williamson* (ANSP).

KANSAS: 1 mi. west of Pleasanton, May 14, 1929, *Anderson* (MBG); prairies, McPherson, June 1887, *Bodin* (UM); prairie, Greenwood Co., May 1, 1879, *Broadhead* (MBG); Lawrence, Douglas Co., May 19, 1892, *Carleton* (KA); Garrison, May 10, 1886, *Cleburne* (UN); Perry, Jefferson Co., Oct. 12, 1896, *Clothier* (KA); Marshall Co., July 25, 1897, *Clothier & Whitford* (KA); Atchison Co., Aug. 2, 1897, *Clothier & Whitford* (KA); Miami Co., Aug. 8, 1897, *Clothier & Whitford* (KA); Linn Co., Aug. 9, 1897, *Clothier & Whitford* (KA); Labette Co., Aug. 18, 1897, *Clothier & Whitford* (KA); Montgomery Co., Aug. 19, 1897, *Clothier & Whitford* (KA); Elk Co., Aug. 20 & 21, 1897, *Clothier & Whitford* (KA); Cowley Co., Aug. 22, 1897, *Clothier & Whitford* (KA); Sumner Co., Aug. 28, 1897, *Clothier & Whitford* (KA); Harvey Co., Aug. 24, 1897, *Clothier & Whitford* (KA); Sedgwick Co., Aug. 24, 1897, *Clothier & Whitford* (KA); Woodson Co., Aug. 29, 1897, *Clothier & Whitford* (KA); Coffey Co., Aug. 31, 1897, *Clothier & Whitford* (KA); Osage Co., Sept. 2, 1897, *Clothier & Whitford* (KA); near Valley Center, 1880, *Edmondson* (OU); Cloud Co., 1930, *Frazer 329* (UW, KA); Perley's Hill north of Emporia, May 9, 1891, *Gillett* (KA); Roper, Wilson Co., May 5, 1896, *Haller* (KA); abundant on sandy soil 2 mi. southwest of Iron Mound, Saline Co., April 19, 1930, *Hancin 156* (KA); hilltop near Manhattan, Riley Co., May 21, 1920, *Herr* (KA); Eureka, Greenwood Co., July 1892, *Hitchcock* (KA); White Water, Butler Co., July 1892, *Hitchcock* (KA); Olathe, Johnson Co., Aug. 1892, *Hitchcock* (KA); Chase Co., Aug. 1895, *Hitchcock* (KA); Marion Co., Aug. 1895, *Hitchcock* (KA); Cherokee Co., May 1896, *Hitchcock* (KA); Geary Co., June 1896, *Hitchcock* (KA); Allen Co., July 1896, *Hitchcock* (KA); Franklin Co., July 1896, *Hitchcock* (KA); Chautauqua Co., Aug. 8, 1896, *Hitchcock* (KA); Montgomery Co., Aug. 1896, *Hitchcock* (KA); Kingman Co., Aug. 23, 1898, *Hitchcock* (KA); Atchison Co., Oct. 3, 1896, *Hitchcock* (KA); Manhattan, Riley Co., May 10, 1888, *Kellerman* (MBG,KA); upland prairie west of Wabaunsee, Wabaunsee Co., April 29, 1927, *Maus 51* (KA); upland prairie north of Auburn, Shawnee Co., July 4, 1927, *Maus 843* (KA); Reno Co., 1898, *Murphy* (KA); near Altamont, Labette Co., May 11, 1924, *Nelson* (KA); White City, Morris Co., May 17, 1893, *Norton* (KA); prairie, Riley Co., June 17, 1895, *Norton 77* (MBG,KA,NM); Chapman Twp., Ottawa Co., May 17, 1888, *Panton 12* (KA); Topeka, Shawnee Co., May 5, 1879, *Popenoe* (KA); Arkansas City, 1881, *Price* (KA); Emporia, May 4, 1890, *Tyler* (MBG); near Eldorado, Butler Co., May 12, 1897, *Smith* (ANSP); Wichita, Sedgwick Co., May 1929, *Wellman* (UW); Cowley Co., April 1898, *White* (MBG,KA).

OKLAHOMA: rocky prairie, Wichita Nat. Forest, April 26, 1930, *Angst 1427* (UO); woods west of Tecumseh, May 2, 1932, *Barkley 136* (UO); dry upland 3 mi. east of Norman, April 22, 1928, *Barkley* (UO); prairie 2 mi. east of Norman, May 19, 1924, *Bruner* (UW,UO); 7 mi. northeast of Mangum, April 30, 1931, *Bull 110* (UO); common on prairies, Sapulpa, July 22, 1894, *Bush 59* (MBG); common, Sapulpa, May 4, 1895, *Bush 1115* (MBG,ND); without definite locality, 1877, *Butler* (MBG); wooded mountain side, north of Wilburton, Latimer Co., June 13, 1930, *Clark 2821* (UO); vicinity of Fort Sill, April 17, 1916, *Clomens 11622* (MBG); low hills, Asher, Pottawatomie Co., April 10, 1936, *Demaree 11970* (MBG); low clay hills, sandy ridges, Antlers, Choctaw Co., April 10, 1936, *Demaree 11995* (MBG,NYB); Norman, April 6, 1915, *Emig 437* (MBG); 6 mi. northwest of Stillwater, May 18, 1931, *Featherly* (MBG); prairie east of Boyd, May 14, 1927, *Felder 59* (UO); wasteland near Atoka, April 6, 1928, *Folsom 65* (UO); common, gravelly hillsides near Tishomingo, Johnston Co., April 8, 1916, *Houghton 3603* (MBG); on roadsides and in pastures, Norman, Cleveland Co., April 24, 1917, *Jeffs* (UO); prairie, northeast of Oklahoma City, April 29, 1928, *Johnston* (UO); vicinity of Fort Tawson, Choctaw Co., May, *Leavenworth* (NYB); Muskogee Co., April 10, 1927, *Little 1257* (UO); Stillwater, May 1, 1897, *Myers* (OU); open woods at Interstate Bridge, southern Oklahoma, April 11, 1928, *Nelson 10817* (MBG); chiefly on the False Washita River between Fort Cobb and Fort Arbuckle, coll. of 1868, *Palmer 119* (NYB); open woods on mountain side near Page, LeFlore Co., Sept. 9, 1913, *Stevens 2762* (UM).

TEXAS: near Lyons, Burleson Co., Mar. 1927, *Martin 7242* (UT); Bonham, April 13, 1896, *Milligan* (USN); Denison, Grayson Co., April 10, 1933, *Polson 14* (UT); no definite locality, coll. of 1839, *Mohr* (USN); prairies, Paris, April 10, 1904, *Reverchon* (MBG); no definite locality, *Wright* (ANSP).

SOUTH DAKOTA (?): no definite locality, coll. of 1865, ex *Herb. Glatfelter* (MBG).

**16. *B. leucophaea* Nutt. var. *glabrescens* Larisey, var. nov.<sup>26</sup>**

As the species except less pubescent throughout, and stem glabrous.

Distribution: prairies and rocky open woods, Wisconsin, southwest to Louisiana and Texas.

**CITATION OF SPECIMENS:**

LOUISIANA: prairies, Crowley, Mar. 24, 1908, *Brainerd* (GH); prairie, Minden, April 15, 1901, *Trelease* (MBG); open woods near Chestnut, Natchitoches Parish, April 19, 1934, *Wherry* (UP).

WISCONSIN: valley of the Wisconsin River, near Pedanwell Rock, Juneau Co., July 18, 1894, *Cheney* (UW); sand at foot of Trempealeau Mtn., Trempealeau Co., June 1, 1935, *Fassett & Hanson 17368* (UW); roadside, Fall Creek, Eau Claire Co., June 15, 1928, *Kuns 102* (UW); Camp Douglas, July 7, 1890, *Mearns 225* (USN).

MISSOURI: Rolla, April 28, 1915, *Bridge* (LB); woods, Grandin, May 8, 1905, *Bush 2755* (MBG); open woods, Pontiac, April 24, 1934, *Bush 13304* (MBG);

<sup>26</sup>Ab specie differt omnino minore pubescentia et caule glabro.

wooded hills, Lane's Prairie, May 8, 1934, *Bush 13469* (MBG); Potosi, June 3, 1892, *Dewart* (MBG); Victoria, July 1, 1871, *Douglass* (MBG); Ironton, May 12, 1893, *Eggert* (MBG); Allenton, May 2, 1896, *Eggert* (MBG, NYB); Meramec Highlands, 1905, ex *Herb. Glatfelter* (MBG); near Arcadia, Iron Co., May 1925, *Greenman 4780* (MBG); Victoria, April 10, coll. of 1890, *Hitchcock* (MBG); Iron Mountain Lake, Iron Co., May 13, 1928, *Kellogg 1798* (MBG); Pilot Knob, Iron Co., May 10, 1936, *Larisey 4* (MBG, TYPE); flinty hill, Allenton, May 15, 1898, *Letterman* (MBG, USN); Jefferson Co., May 2, 1926, *Mathias 833* (MBG); dry upland soil, about 3 mi. south of Catawissa, Franklin Co., May 12, 1929, *Steyermark 886* (MBG); upland cherty woods above limestone bluffs along Big Piney River, near Hooker, Pulaski Co., May 4, 1934, *Steyermark 8059* (MBG); prairie opening along RR. between Versailles and Stover, Morgan Co., July 8, 1934, *Steyermark 13213* (MBG); cherty upland woods 3 mi. south of Corkery, Dallas Co., July 20, 1934, *Steyermark 13799* (MBG).

ARKANSAS: woods, Fulton, April 14, 1905, *Bush 2321* (MBG); rocky woods, Marion Co., April 24, 1934, *Bush 13334* (MBG); dry woods near Eureka Springs, May 8, 1902, *Canby, Sargent & Bush 27* (GH); on Grand Prairie about 0.5 mi. west of Sereeton Prairie Co., May 1, 1923, *Harper 27* (USN, GH, NYB, ANSP); on roadside 3 mi. east of Logan Gap Road on Highway 270, Montgomery Co., April 27, 1935, *Lodewyks 174* (MBG); rocky ground, foot of Maumelle Mtn., near Pinnacle Station, Pulaski Co., June 1, 1923, *Palmer 23012* (MBG); rocky open ground near High Point, Garland Co., April 25, 1924, *Palmer 24547* (MBG); Judsonia, April 30, 1877, *Reynolds* (OU); on clay hills, Hot Springs, July 10, 1931, *Runyon 1465* (USN).

OKLAHOMA: low hills by Big Taxodium, Broken Bow, McCurtain Co., April 11, 1936, *Demaree 12061* (NYB); prairie near Ardmore, Carter Co., *Stevens 74* (MBG).

TEXAS: Fannin Co., *Milligan* (NM); Goliad, Feb. 1927, *Williams 7* (ANSP).

**17. *B. laevicaulis* (Gray) Small** in Bull. Torr. Bot. Club 25: 134. 1895; Small, Fl. Southeast. U. S., ed. 1, 601. 1903, and ed. 2, 601. 1913; Cocks, The Leguminosae of Louisiana. La. State Mus. Nat. Hist. Surv. Bull. 1: 6, pl. 7. 1910.

*B. leucophaea* Nutt. var. *laevicaulis* Gray in Hall's Pl. Texas, 7. 1873, *nomen nudum*; Canby in Bot. Gaz. 4: 132. 1879.

*B. oxyphylla* Greene, Leaflets Bot. Obs. 2: 84. 1910.

Plant 3-7 dm. high, darkening in drying, tawny-pubescent to villous in parts; stem stout, ribbed, glabrous, widely subdichotomously branched, branches divaricate; leaves subsessile to short-petiolate, petioles stout, channelled, semiamplexicaul, 2-4 mm. long, leaflets obovate to rhombic, strongly cuneate, apex acute, mucronate, 4-7 cm. long, 2-3.5 cm. broad, firm, finely reticulate, glabrous on both surfaces, ciliate along the margins and midvein, lateral leaflets more or less decurrent along the petiole; stipules ovate-lanceolate, acuminate, 1-3.5 cm. long,

reticulate, ciliate along the margins, persistent; racemes axillary, 1-2.5 dm. long, secund, declined; floral bracts ovate to cordate-lanceolate, 1-2.5 cm. long, reticulate, ciliate along the margins, persistent; pedicels slender, 1.5-3.5 cm. long; calyx-tube 1 cm. deep, glabrate within, densely ciliate along the margins, strongly nerved, upper lip distinctly two-lobed, lobes of the lower lip lanceolate-acuminate, 4-5 mm. long; corolla cream or yellow, standard suborbicular, deeply emarginate, 2 cm. high, 2 cm. broad, wings and keel 2.2-2.4 cm. long; ovary densely villous, mature pod ovoid-elliptic, inflated, 3-4 cm. long, 1.5-2.5 cm. broad, brownish-black, strongly reticulate, more or less appressed pubescent, long-stipitate, stipe exceeding the calyx 3-4 mm., body tapering gradually into a slender beak.

Distribution: prairies, Louisiana and Texas.

#### CITATION OF SPECIMENS:

LOUISIANA: longleaf-slash pine flat woods east of Hammond, Tangipohoa Parish, April 22, 1934, *Brown 3956* (LU); pine woods, St. Helena Parish, April 24, 1934, *Brown 5206* (LU); pine flat woods east of Hammond, Tangipohoa Parish, June 2, 1935, *Brown 6345* (LU); cut-over longleaf pine hills north of Montpelier, St. Helena Parish, April 3, 1936, *Brown 6192* (LU); pine-hardwood ridge in prairie area north of Crowley, Acadia Parish, April 26, 1936, *Brown 6272* (LU); prairie along RR., west of Crowley, Acadia Parish, April 26, 1936, *Brown 6282* (LU); prairie along RR., Esterwood, Acadia Parish, April 26, 1936, *Brown 6291* (LU); common on "Hallaway" prairie near Hallaway Church east of Pineville, Rapides Parish, June 23, 1936, *Brown 6433* (LU); Pearl River, Oct. 1901, *Cocks* (NYB, TYPE of *B. oxyphylla* Greene, (ND); open fields, Bayou LaCombe, April 1909, *Cocks 1790a* (TU); cleared pine woods, Bayou LaCombe, April 2, 1910, *Cocks 1790b* (NYB); prairies, Crowley, April 2, 1911, *Cocks* (TU); pine barrens, Covington, April 1913, *Cocks* (TU); no definite locality, *Hale* (ANSP); no definite locality, *Hale 210* (NYB, TYPE); close soil, Alexandria, *Hale* (GH); in prairies, Opelousas, April 1880, *Langlois* (NYB); in prairies, Calcasieu, April 25, 1884, *Langlois* (NYB); in plains, Calcasieu Co., fl. April 26, 1884, *Langlois* (NYB); Chataignier, fr. May 20, 1884, *Langlois 4* (NYB); in plains, Chataignier, St. Landry Co., May 20, 1885, *Langlois 5* (NYB); in prairie, "Fakataite," near Chataignier, June 21, 1885; *Langlois* (NYB); in pine woods near St. Martinsville, May 1, 1893, *Langlois* (UM); low prairies, Jennings, Jefferson Davis Parish, May 15, 1915, *Palmer 7614* (MBG, USN, ANSP); sandy soil, roadsides, and cut-over pine land, 2 mi. north of Tioga, Rapides Parish, April 6, 1935, *Smith 97* (LU).

TEXAS: Colorado River, April 1828 (1849-1), *Berlandier 289* (MBG, USN, NYB, UW); Virginia Point, April 15, 1899, *Bray 22* (USN, UT); common on prairies, Columbia, April 9, 1899, *Bush 67* (MBG); Fayette Co., 1892, *Crawford 29* (USN); on Carizo sands, Terrell land, Wilson Co., Mar. 25, 1937, *Cutler* (MBG); occasional



on sand, 4 mi. south of Bandera, Bandera Co., Mar. 26, 1937, *Cutler 881* (MBG); sand hills north of Longview, Gregg Co., April 19, 1899, *Eggert* (MBG); prairies north of Houston, Harris Co., April 21, 1899, *Eggert* (MBG); Houston, April 24, 1937, *Fisher 37267* (USN); wet prairies, Houston, April 10, 1872, *Hall 161* (MBG, USN,GH,NYB); Beaumont, May 1, 1936, *Hooks* (UT); Brenham, May 21, 1934, *Lehman* (UT); prairies west of Brazos, April 1939, *Lindheimer* (MBG); prairies northwest of Houston, May 19, 1840, *Lindheimer 51* (MBG); near Houston, April 1842, *Lindheimer* (MBG,GH); no definite locality, *Lindheimer & Buckley* (ANSP); Victoria, Victoria Co., Mar. 30, 1905, *Lewton 73* (USN); Victoria, April 28, 1905, *Mason 3812* (USN); prairies of the Rio Grande, *Meyer 7844* (NYB); sandy prairies, Columbia, Brazoria Co., Mar. 24, 1914, *Palmer 5001* (MBG); prairies, Ganado, Jackson Co., Mar. 6, 1916, *Palmer 9072* (MBG); prairies near Houston, Harris Co., April 15, 1928, *Palmer 33316* (MBG,GH); 20 mi. east of Houston, May 10, 1936, *Penfound 1-16* (UT); common in sand, Big Sandy, May 27, 1901, *Reverchon* (MBG); near Houston, May 6, 1899, *Rose 4192* (USN,GH,NYB); San Marcos and vicinity, *Stanfield* (NYB); Hallettsville, June 11, 1923, *Tharp 2295* (USN,UT); sandy oak woods, Goliad, July 1, 1925, *Tharp 3504* (USN,UT); Lovelady, April 20, 1933, *Tharp* (UT); dry sandy soil near Hearne, Robertson Co., Mar. 28, 1930, *Wolff 1385* (USN); no definite locality, *Wright* (GH).

**18. *B. cuneata*** Small in Bull. Torr. Bot. Club **25**: 139. 1898; Small, Fl. Southeast. U. S., ed. 1, 601. 1903, and ed. 2, 601. 1913.

Plant essentially glabrous, leaf margins slightly pubescent in bud; stem firm, ribbed, sparingly branched, branches subdichotomous, ascending; leaves subsessile, occasionally short-petiolate, petioles 2-4 mm. long, leaflets obovate, cuneate, mucronate, 3-6 cm. long, 2.5-3.5 cm. broad, leathery, barely reticulated, glabrous, slightly discolored in drying; stipules lanceolate to ovate-lanceolate, 0.5-1 cm. long, persistent; racemes 1 dm. long, opposite the branches, erect; floral bracts lanceolate to ovate-lanceolate, acuminate, 1-2 cm. long, lowermost sometimes 3 cm. long, usually persistent; pedicels slender, 1.5-2.5 cm. long, 3.5 cm. long in fruit; calyx-tube reticulate, 1 cm. deep, 8-9 mm. wide, only slightly pubescent within, upper lip emarginate, lobes separating widely at shallow cleft, lobes of the lower lip ovate, acute, 4-5 mm. deep; corolla pale cream, standard deeply notched, 2 cm. high, 2 cm. broad, wings and keel 2-2.2 cm. high; ovary glabrous, occasionally ciliate along sutures; pods ovoid-elliptic, 2 cm. long, 1.3 cm. broad, brownish-black, firm, rugose, pubescent within, long stipitate, stipe 1.3 cm. long, abruptly long-beaked, beak 1.8 cm. long.

Distribution: in sand near the coast, Texas.



## CITATION OF SPECIMENS:

TEXAS: "Las Animas de Matamoros al Rio de las Neueces," April 1834, *Berlandier 2554* (GH,NYB,ANSP); Victoria, April 6, 1900, *Eggert* (MBG); along Neueces Bay, Neueces Co., April 3, 1894, *Heller 1523* (NYB,TYPE, MBG,USN,GH,ANSP,OU,UN); sandy hills below Sarito, May 14, 1928, *Tharp 5963* (USN,UT); Redfish Bay, Mar. 5, 1934, *Tharp* (UT); Katherine, Mar. 25, 1907, *York* (UT).

19. × *B. intermedia* Larisey, *hyb. nov.*<sup>27</sup>

= *B. leucophaea* var. *glabrescens* × *B. viridis*.

Plant 0.5–1 m. high, tawny-, or occasionally whitish-pubescent throughout, darkening slightly in drying; stem somewhat stout, firm, heavily ribbed, pubescent when young, glabrate in age, primary stem geniculate, simply but widely branched, branches ascending; leaves compound, short-petiolate, petioles stout, semiamplexicaul, channeled, 2–5 mm. long; leaflets spatulate-elliptic to oblanceolate, occasionally rhombic-cuneate, acute, rarely retuse at the apex, somewhat delicate but firm, reticulate, pubescent above and below when young, glabrate in age, frequently ciliate along the margins and midvein, 5–7 cm. long, 1.5–2.5 cm. broad; stipules ovate, cordate-lanceolate to lanceolate, reticulate, 0.5–1.2 cm. long, usually persistent; racemes axillary, compact, erect, slightly flexuous, 1–3 dm. long; flowers numerous, closely spaced, ascending; floral bracts ovate to cordate-lanceolate, reticulate, 0.8–1.5 cm. long, persistent; pedicels slender, 0.5–1 cm. long; calyx-tube 0.8–1 cm. deep, upper lip entire, barely cleft to slightly emarginate, lobes of the lower lip lanceolate, 4–5 mm. long; corolla yellow, standard 1.6–1.8 cm. high, 1.4–1.6 cm. broad, wings and keel 2–2.2 cm. long; ovary densely pubescent, mature pod unknown.

Distribution: prairies, Louisiana and Texas.

## CITATION OF SPECIMENS:

LOUISIANA: pine-hardwood ridge in prairie area north of Crowley, Acadia Parish, April 26, 1936, *Brown 6273* (LU); prairie west of Crowley, Acadia Parish, April 26, 1936, *Brown 6276* (LU); prairies, Lake Charles, April 1914, *Cocks* (TU); no definite locality, May, *Hale 309* (ANSP); prairie about 1 mi. west of Crowley, Acadia Parish, April 7, 1936, *Harper 3476* (MBG,TYPE, USN,GH,NYB,ANSP).

TEXAS: Rosenberg, April 5, 1900, *Eggert* (MBG); Houston, April 2, 1930, *Fisher 71* (USN).

<sup>27</sup>Inter *leucophaeam* et *viridem* media. Herba 0.5–1.0 m. alta, ramis ascenditibus. Folia composita, foliolis elliptico-spatulatis vel oblanceolatis fere rhombo-cuneatis apice acutis raro retusis. Racemi axillares erecti paulo flexuosi.

**20. × *B. stricta* Larisey, hyb. nov.<sup>28</sup>**

= *B. leucophaea* × *B. sphaerocarpa*.

*B. villosa* Nutt. ex Britton & Brown, *Illust. Fl. North. U. S.*, ed. 1, 2: 266, *fig. 2051*. 1897, in part, and ed. 2, 2: 345, *fig. 2455*. 1913, in part; Gray, *New Man. Bot.*, ed. 7, 506. 1908, in part.

Plant finely tawny-villous throughout, darkening into deep brown or black in drying; stem erect, simply branched, branches ascending; leaves subsessile to short-petiolate, petioles 1–2 mm. long; leaflets oblanceolate-elliptic, apex rounded, only rarely retuse, 4–7 cm. long, 1–2 cm. broad, lateral leaflets usually converging; stipules ovate-lanceolate, acuminate, usually 1–2 cm. long, sometimes less, horizontal or pendulous, usually persistent; racemes opposite the branches, erect, compact, 1–2 dm. long, flowers ascending, slender pedicels closely appressed to axis, 1–2.5 cm. long; calyx-tube 0.8–1 cm. deep, upper lip barely cleft, lobes of the lower lip lanceolate, 3–4 mm. deep; floral bracts persistent, lowermost sometimes foliaceous, ovate-acuminate, 1–1.5 cm. long, uppermost lanceolate, usually less than 1 cm. long; corolla yellow, standard 1.5 cm. long, wings on keel 2 cm. long; ovary densely villous, mature pod unknown.

Distribution: prairies, Arkansas and Oklahoma.

**CITATION OF SPECIMENS:**

ARKANSAS: Baker Springs, Howard Co., April 22, 1909, *Kellogg* (MBG); no definite locality, *Nuttall* (ANSP, TYPE, NYB); 3 mi. north of Kirby, April 14, 1932, *Wilkins 1417* (USN).

OKLAHOMA: prairies, Bryan Co., April 21, 1932, *Blain 233* (USN); prairie, 10 mi. north of Limestone Gap, May 18, 1877, *Butler* (MBG).

**21. *B. Bushii* Small, Fl. Southeast. U. S., 600, 1331. 1903, and ed. 2, 600. 1913.**

Plant 5–7 dm. high, more or less woolly-tomentose throughout; stem stout, ribbed, diffusely branched, branches subdichotomous; leaves sessile to short-petiolate, petioles less than 3 mm. long, pale green, leaflets sessile, blades thick, oblanceolate to rhombodial, cuneate, acute or obtuse, 3–6 cm. long, 1.5–2.5

<sup>28</sup>Inter *leucophaeam* et *sphaerocarpam* media; foliolae oblanceolato-ellipticae apice rotundatae raro retusae; racemi axillares non secundi, flores erecti; corolla flava.

cm. wide, finely reticulate; stipules ovate-lanceolate to lanceolate, 0.5–2 cm. long, persistent; racemes numerous, axillary, 1–2 dm. long, secund, somewhat flexuous, ascending; floral bracts ovate to ovate-lanceolate, 1–2 cm. long, persistent; pedicels slender, 0.5–3 cm. long; calyx-tube 1 cm. deep, upper lip entire, subconnate or emarginate, lobes of the lower lip deltoid-lanceolate, 2–3 mm. long; corolla cream-yellow, standard 1.8–2 cm. high, 1.4–1.6 cm. broad, wings and keel 2.2–2.4 cm. long; ovary villous, mature pod ligneous, ovoid, inflated, 2 cm. long, 1.5 cm. broad, strigillose, rugose, somewhat reticulate, stipe equaling the length of the calyx, long-beaked, beak equalling the length of the body.

Distribution: prairies, eastern Texas.

CITATION OF SPECIMENS:

TEXAS: common on prairie, Columbia, April 9, 1899, *Bush 68* (NYB,TYPE, MBG, USN,GH,ND); Boca Chica, Cameron Co., Mar. 31, 1933, *Clover 769* (NYB); "Rio Brazos," 1833, *Drummond* (GH); Sutherland Springs, April 2, 1932, *Jones 29325* (MBG); on flats by Gulf of Mexico near Corpus Christi, April 6, 1932, *McKelvey 1743* (USN,GH); Aransas Pass, San Patricio Co., May 1913, *Orcutt 5963* (MBG); Galveston, April 18, 1906, *Tracy 9346* (MBG,USN,GH,NYB,UP,UM,UW,UN,UT).

**22. *B. alba* (L.) Vent.** Dec. Gen. Nov. 9. 1808, without description; R. Br. in Ait. Hort. Kew. ed. 2, **3**: 6. 1811, with description; Ell. Sketch Bot. S. Car. & Ga. **1**: 468. 1821; DC. Prodr. **2**: 100. 1825; Torr. & Gray, Fl. N. Am. **1**: 386. 1840; Chapman, Fl. South. U. S., ed. 1, 112. 1860, ed. 2, 112. 1889, and ed. 3, 122. 1897; Britton & Brown, Illust. Fl. North. U. S., ed. 1, **2**: 267, *fig. 2053*. 1897, in part, and ed. 2, **2**: 346, *fig. 2457*. 1913, in part; Small, Fl. Southeast. U. S., ed. 1, 600. 1903, and ed. 2, 600. 1913; Gray, New Man. Bot., ed. 7, 506. 1908; Small, Man. Southeast. Fl. 677. 1933.

*B. albiflora* Raf. New Fl. N. Am. **2**: 47. 1836 [1837].

*Crotalaria alba* L. Sp. Pl. **2**: 716. 1753.

*Sophora alba* L. Syst. Nat., ed. 12, **2**: 287. 1767; Syst. Veg., ed. 13, 325. 1774.

*Podalyria alba* Willd. in L. Sp. Pl., ed. 4, **2**: 503. 1799.

Plant 2 m. or less high, virtually glabrous, occasionally sparingly pubescent in parts; stem slender, dull yellow to purplish-brown in age, somewhat glaucous, subdichotomously branched,

branches geniculate, divaricate, lower ones frequently declined; leaves petiolate, petioles 0.4–1.2 cm. (average 0.5–0.8 cm.) long, occasionally slightly pubescent, leaflets spatulate-oblong to obovate, cuneate, apex usually rounded, slightly apiculate or retuse, rarely acute, 2–3 cm. long, 0.8–1.0 cm. wide, glabrous and glaucous beneath; stipules minute, deltoid-lanceolate to setaceous, mostly caducous; racemes 2.5–5 dm. (average 4 dm.) long, flowers subverticillate; floral bracts oblong-ovate, 5–7 mm. long, sometimes ciliate at margins, caducous; pedicels usually shorter than the calyx, 2–4 mm. long, though at times twice as long as the calyx, 0.8–1 cm. long; calyx-tube 4–5 mm. deep, usually as wide as deep, upper lip entire, lobes of lower lip deltoid to broadly ovate, 1.5–2.5 mm. long; corolla white, standard sometimes splotched with purple, reflexed, 1–1.2 cm. high, 1.1–1.3 cm. wide, wings and keel less than 1.5 cm. long; fruit cylindrical, inflated, dusky brown, 2.5–3 cm. long, 0.5–1 cm. broad, long-stipitate, stipe 0.8–1 cm. long, abruptly short-beaked.

Hybridizes with *B. tinctoria* var. *crebra* in eastern Virginia.

Distribution: dry sandy pinelands, eastern Virginia south to Florida.

CITATION OF SPECIMENS:

VIRGINIA: Accomac, Aug. 1923, *Jones* (UP); in open stand of *Pinus Taeda*, 3.5 mi. north of Accomac, Accomac Co., June 29, 1928, *Jones* (MBG); in dry sandy field north of Accomac, Accomac Co., May 19, 1930, *Moldenke 1253* (MBG, NYB, UP, DU); open pine woods 4 mi. north of Accomac, Accomac Co., May 31, 1937, *Tatnall 3363* (ANSP); sandy soil in open pine woods 4 mi. north of Accomac, Accomac Co., June 29, 1928, *True* (UP).

NORTH CAROLINA: Guilford, July 1895, *Ashe* (MBG); Asheboro, June 1898, *Ashe* (FM); Statesville, June 6, 1879, *Gray*, *Sargent*, *Redfield & Canby* (ANSP); woods, Statesville, June 6, 1879, *Redfield 11701* (MBG); Statesville, June 1878, *Hyams* (USN).

SOUTH CAROLINA: sand dunes, southern border of Williamsburg Co., May 21, 1930, *Bright 2955* (ANSP); Aiken, May 1869, *Canby* (MBG, USN, GH, NYB, ANSP, FM); Columbia, May 9, 1899, *Canby & Sargent 19* (GH); Aiken, May 1888, *Darlington* (FM); Anderson Co., 1885, *Gibbes* (NYB); woods near Clemson, Pickens Co., May 18, 1907, *House 3359* (NYB); vicinity of Columbia, May 1888, *McCarthy* (USN); Columbia, June 4–7, 1894, *MacFarlane* (UP); Aiken, April 1871, *Smith* (UP); dry pine woods, Columbia, April 1890, *Taylor* (FM); dry sandy open longleaf pine woods near North, Orangeburg Co., April 26, 1932, *Weatherby 6111* (USN, GH, NYB).

GEORGIA: Augusta, *Curtis* (ANSP); Augusta, June 1894, *MacFarlane & Davis*

(UP); dry sandy field south of Kingsland, Camden Co., May 12, 1930, *Moldenke 1179A* (NYB,UP); middle Ga., May 6, 1846, *ex Herb. Porter* (ANSP); dry sandhills 3 mi. east of Butler, Taylor Co., April 30, 1933, *Pyron & McVaugh 2799* (MBG); dry roadside 1.25 mi. north of Cleveland, White Co., May 14, 1938, *Pyron & McVaugh 2883* (MBG); Ocmulgee River Swamp below Macon, May 18-24, 1895, *Small* (NYB).

FLORIDA: no definite locality, coll. of 1846, *Chapman* (MBG); Quincy, *Chapman* (MBG); Gadsden Co., coll. of 1889, *Chapman* (MBG,USN); no definite locality, *Chapman* (NYB,UW); "in pinetia, prope Quincy," May 1843, *Eugel* (NYB); pinelands near Wewahatchka, May 7, 1926, *Small, Mosier & Matthaus* (NYB); field, Quincy, April 19, 1930, *Tisdale & West* (MBG).

**23. *B. albescens*** Small, Fl. Southeast. U. S., ed. 1, 600, 1331. 1903, and ed. 2, 600. 1913; Small, Man. Southeast. Fl. 677. 1933.

Plant 1 m. or less high, slightly pubescent throughout, frequently glabrate in age; stem slender, firm, lemon through deep yellow to tan in age, glaucous, subdichotomously branched, inner branches ascending, outer sometimes widely spreading; leaves petiolate, petioles slender, 0.5-1.8 cm. (average 1.2-1.5 cm.) long, pubescent; leaflets elliptic to obovate, sometimes slightly cuneate, rounded and slightly retuse at the apex, or acute and finely mucronate, 3.5-6 cm. long, 1-1.5 cm. broad, pubescent on lower surface especially along the midrib, usually glabrous above; stipules minute, deltoid, subulate to setaceous, caducous, or lanceolate, 5 mm. long, persistent; raceme 1.5-4 dm. (average 2.5 dm.) long, flowers subverticillate; floral bracts oblanceolate, 5-7 mm. long, ciliate, caducous; pedicels rarely longer than the calyx, 5-6 mm. long; calyx-tube 5-6 mm. deep, upper lip entire or slightly emarginate, lobes of the lower lip deltoid 1.5-2 mm. long; corolla white, standard not conspicuously reflexed, 1.3-1.5 cm. high, 1.5-1.8 cm. wide, wings and keel usually more than 1.5 cm. high, exceeding the standard by about 2 mm.; mature pod cylindrical, inflated, 3.5 cm. long, 1 cm. broad, yellow-brown, reticulate, short-stipitate, stipe barely exceeding the calyx.

Hybridizes with *B. perfoliata* in Georgia.

Distribution: sandy pine woods, North Carolina and Tennessee, south to Georgia.

CITATION OF SPECIMENS:

NORTH CAROLINA: no definite locality, *Curtis* (NYB); roadside, Mayodan, June 3, 1928, *Schallert 8456* (DU); Flat Rock, coll. of 1861, *ex Herb. Gibbs* (NYB).



SOUTH CAROLINA: Oconee Co., May 27, 1897, *Anderson* (UM); no definite locality, *Backman* (ANSP); Columbia, May 16, 1912, *Bartram* (NYB); sandy barrens, S. Williamsburg Co., May 21, 1931, *Bright 2953* (GH); pine barrens, Summerville, May 1892, *Brownfield 643* (UW); "in umbrosis humidis," *Elliott* (CM); open pine woods, Summerville, May 22, 1855, ex *Herb. Hezamer & Maier* (GH); sandy hillside near Black Creek between Hartsville and Dovesville, about 5 mi. from Hartsville, June 7, 1921, *Norton* (USN); Summerville, April 29–May 10, 1918, *Perkins* (GH); Santee Canal, May, *Ravenel* (GH,CM); Batesburg, May 22, 1911, *McGregor 656* (USN); Summerville, *Taylor* (USN); pine woods, Summerville, June 1891, *Taylor* (UM); Seneca, Oconee Co., May 1879, *Trelease* (MBG).

GEORGIA: pine barren, Thomson, McDuffie Co., June 15, 1911, *Bartlett 2651* (KA); no definite locality, *Boykin* (ANSP); wooded hillsides in good soil, Augusta, May 15, 1900, *Cuthbert* (NYB); no definite locality, *LeConte* (NYB); Macon, *Loomis* (NYB); near Butler, Taylor Co., *Neisler* (NYB).

TENNESSEE: Polk Co., May 15, 1892, *Ruth* (OU); open woods, Knoxville, May 1897, *Ruth 2217* (NYB,TYPE); thickets, Thompson's, E. Tenn., May 1897, *Ruth* (OU); woodlands, Hiwassee Valley, May 1898, *Ruth* (MBG,NYB,ND).

#### 24. *B. pendula* Larisey, sp. nov.<sup>20</sup>

Height unknown; plant glabrous, somewhat glaucous throughout; stem firm, slender, subdichotomously branched, branches strongly geniculate, spreading, declined; leaves petiolate, petioles 0.8–1.3 cm. long; leaflets elliptic, frequently oblanceolate when young, sometimes slightly cuneate, 4–6 cm. long, 1–2 cm. wide, acute, rarely rounded at apex except occasionally in age, never retuse, margins revolute, texture firm, primary vein deeply impressed, secondary veins regularly placed, nearly parallel, area bordering them usually remaining conspicuously pale; stipules subulate to setaceous, seldom ex-

<sup>20</sup>Herba omnino glabra sat glauca altitudine ignota. Caulis gracilinsculus firmus subdichotome ramosus; ramis valde geniculatis patulis. Folia petiolata, petiolis 8–13 mm. longis; foliolis ellipticis vel immaturitate saepe oblanceolatis apice acutis raro rotundatis haud retusis basi cuneatis 4–6 cm. longis 1–2 cm. latis firmiter membranaceis margine post exsiccationem revolutis, nervo medio profunde impresso venis secundariis regulariter parallelis parenchymate prope nervum venosque post exsiccationem pallidissimo haud nigrescente, stipulis subulatis vel setaceis ca. 3 mm. longis saepissime caducis. Racemi numerosi erecti compacti folia vix superantes 1.5–2.5 cm. longi, bracteis caducis, pedicellis 4–7 mm. longis. Flores subverticillati, calycis tubo 6–8 mm. longo, labro superiore ovato-rotundato vel truncato vel vix emarginato tubum ca. dimidio aequante, labri inferioris lobis deltoideis 2–3 mm. longis, corollae albae (?) vexillo 1.5 cm. longo 1.2 cm. lato, alis carinae 1.7–2.0 cm. longis. Legumen pendulum breviter stipitatum oblongoideum valde inflatum 4.0–4.5 cm. longum 1.5–2.0 cm. latum abrupte breviterque sed anguste rostratum (rostrum ca. 5 mm. longo) nigro-pruinoseum firmum sed tenue et fragile indistincte reticulatum, stipite calycem vix superante.



ceeding 3 mm. in length, mostly caducous; racemes numerous, erect, barely exceeding the foliage, compact, 1.5–2.5 dm. long; flowers subverticillate, floral bracts caducous; pedicels 4–7 mm. long; calyx-tube 6–8 mm. deep, upper lip ovate, rounded to slightly truncate or barely emarginate, one-half the length of the tube, lobes of the lower lip deltoid, 2–3 mm. long; corolla white (?), standard 1.5 cm. high, 1.2 cm. broad, wings and keel 1.7–2 cm. long; mature pod pendulous, short-stipitate, stipe barely exceeding the calyx, body oblongoid, much inflated, black, pruinose, firm but thin and brittle, lightly reticulate, 4–4.5 cm. long, 1.5–2 cm. broad, abruptly short- but slender-beaked, beak 5 mm. long.

Distribution: dry open pine woods and upland sand ridges, lower South Carolina, Georgia and upper Florida.

CITATION OF SPECIMENS:

SOUTH CAROLINA: Bluffton, June 1879, *Mellichamp* (GH); Bluffton, Beaufort Co., Aug. 1879, *Mellichamp* (NYB); Santee River bottom west of St. Paul, Clarendon Co., May 11, 1917, *Stone 616* (ANSP); Hardeeville, April 1894, *Williamson* (ANSP).

GEORGIA: dry open woods bordering the Flint River near Bainbridge, June 19, 1901, *Curtiss 6810* (MBG,TYPE, USN,GH,NYB,UN,UM,KA,COTYPES); rare on drier upland sand ridges, cut-over pine woods and pastures, Tift Co., May 15, 1935, *Stephens* (MBG); shaded roadside south of Ways Station, Route 17, Bryan Co., April 18, 1935, *Tees* (ANSP); Savannah, Mar. 15, *Williamson* (FM).

FLORIDA: E. Fla., *Garber* (MBG); Rosewood, June 1876, *Garber* (ANSP); in low woods, Washington Co., May 22, 1885, *Small* (NYB).

**25. *B. pendula* Larisey var. *obovata* Larisey, var. nov.<sup>30</sup>**

As the species except: leaflets shortly obovate, rounded and occasionally slightly retuse at the apex, 2–3.5 cm. long, 1–1.5 cm. broad; petioles not usually exceeding 5 mm., though sometimes 1 cm. long; terminal raceme exceeding the foliage 1–1.5 dm.; mature pod not known.

Distribution: middle South Carolina.

CITATION OF SPECIMENS:

SOUTH CAROLINA: Columbia, Richland Co., May 16, 1912, *Bartram* (ANSP); along roadside about 15–20 mi. north of Columbia, May 6, 1937, *Coker* (UNC,TYPE, NYB,COTYPE); Newberry Road 5 mi. from Columbia, May 1936, *Philson* (DU).

<sup>30</sup>Ab specie differt foliis breviter obovatis apice rotundatis saepe paululo retusis 2.0–3.5 cm. longis 1.0–1.5 cm. latis, petiolis plerumque 5 mm. longis, rarissime usque ad 1 cm. longis; racemo terminali folia superante 1.0–1.5 dm. longo; legumine maturo ignoto.

**26. *B. pendula* Larisey var. *macrophylla* Larisey, var. nov.<sup>31</sup>**

As the species except: stems stouter, branches longer, leaflets somewhat more delicate, broadly elliptic to obovate, only rarely cuneate, obtuse or rounded at apex, frequently retuse, 4-6 cm. long, 2-2.5 cm. broad.

Distribution: middle and lower Georgia; localized in Kentucky near Paducah.

## CITATION OF SPECIMENS:

GEORGIA: Marshallville, June 8, 1895, *Earle 3120* (NYB); below Augusta, April 1847, *ex Herb. Porter* (ANSP); Experiment, June 2, 1899, *Riegel 29* (KA); along Flint River at Albany, Dougherty Co., May 24-28, 1895, *Small* (FM,NYB).

KENTUCKY: Tennessee-Cumberland River region, Paducah, McCracken Co., May 30-June 20, 1909, *Eggleston 4495* (NYB); open ground along small streams near Paducah, McCracken Co., June 17, 1920, *Palmer 17935* (MBG,TYPE).

**27. *B. leucantha* Torr. & Gray, Fl. N. Am. 1: 585. 1840; Britton & Brown, Illust. Fl. North. U. S., ed. 1, 2: 267, fig. 2054. 1897, and ed. 2, 2: 346, fig. 2458. 1913, in part; Small, Fl. Southeast. U. S., ed. 1, 600. 1903, and ed. 2, 600. 1913, in part; Gray, New Man. Bot., ed. 7, 506. 1908, in part; Rydb. Fl. Prairies & Plains Central N. Am. 455. 1932, in part; Small, Man. Southeast. Fl. 678. 1933, in part.**

*Podalyria alba* Sims in Curt. Bot. Mag. 29: pl. 1177. 1809, not *B. alba* R. Br., not *Sophora alba* L.

Plant 1.5-2 m. high, glabrous throughout, glaucous, blackening in drying; stem solitary, stout, succulent, heavily ribbed, widely but simply branched, branches ascending, usually straight but occasionally slightly geniculate toward the ends; leaves deep green, blackening early, petiolate, petioles 5-10 mm. long, or upper leaves often subsessile, leaflets cuneate-obovate to nearly elliptic or oblanceolate, 2.5-6.5 cm. long, 1.5-3 cm. broad, obtuse, retuse, or mucronate at the apex, undulate, sometimes revolute; stipules lanceolate, usually about the length of the petioles though sometimes less, mostly caducous; racemes few, stout, erect, flexuous, central raceme 2-6 dm. long, lateral ones usually not exceeding 4 dm.; flowers numerous,

<sup>31</sup>Ab specie differt caulibus crassioribus, ramulis longioribus; foliis paulo delicatioribus late ellipticis vel obovatis raro cuneatis apice obtusis vel rotundatis saepe retusis 4-6 cm. longis 2.0-2.5 cm. latis.

subverticillate, usually horizontal or occasionally slightly ascending, pedicels 3–10 mm. long; floral bracts ovate-lanceolate, 8–10 mm. long, usually caducous; calyx-tube 7–9 mm. long, almost as broad, densely white-pubescent within, upper lip entire or slightly emarginate, lobes of the lower lip ovate-deltoid, one-half to one-third the length of the tube; corolla white, standard splotched with purple, 1.3–1.5 cm. high, 1.5–1.8 cm. broad, wings and keel 2–2.5 cm. long; mature pod firm, black, glaucous, ovoid to oblong, 2.5–4 cm. long, 1–2 cm. broad, slender-stipitate, stipe 2–3 times as long as the calyx, abruptly short-beaked.

Hybridizes with *B. tinctoria* var. *crebra* in Indiana, *B. sphaerocarpa* in Oklahoma, and *B. viridis* in Louisiana and Texas.

Distribution: open prairies, woods, and waste fields, Michigan to Minnesota, southwest to Mississippi, Louisiana and Texas.

CITATION OF SPECIMENS:

MISSISSIPPI: low woods 10 mi. north of Bay St. Louis, April 30, 1926, *Small, Mosier & Matthaus* (NYB).

LOUISIANA: prairie, RR. right-of-way between Scott and Duson, Lafayette Parish, April 19, 1936, *Anderson & Hubricht* (MBG); vicinity of Covington, Fairview, May 8, 1920, *Arañe 11861* (USN); pine flat woods west of Covington, April 22, 1933, *Brown 3967* (LU); pine flat woods 5 mi. east of Hammond, July 15, 1933, *Brown 4088* (LU); Covington, May 1900, *Cocks* (LU); pine barrens, Covington, April 2, 1902, *Cocks 1626* (NYB,TU); pine barrens, Pineville, April (2), 10, 1911, *Cocks* (NYB,LU,TU); Alexandria, *Hale* (NYB); plains, Abbeville, May 28, 1882, *Langlois* (NYB); Cat Island (Miss. delta & adjacent island), Aug. 26, 1900, *Lloyd & Tracy 251* (NYB); open upland woods, Natchitoches, April 25, 1915, *Palmer 7370* (MBG); dry open ground, Creston, Natchitoches Parish, April 14, 1916, *Palmer 9427* (MBG,USN); hills near Bogalusa, May 2, 1926, *Small, Mosier & Matthaus* (NYB); silt loam, open prairie, Holloway Prairie, Rapides Parish, July 10, 1935, *Smith 115* (LU).

OHIO: Paxton Twp., Ross Co., Nov. 2, 1930, *Bartley & Pontius* (OU); opening in pin- and white-oak swamp forest, Five-Mile, Brown Co., Nov. 3, 1932, *Braun* (LB); Georgesville, Franklin Co., July 2, 1900, *Coberly* (OU); West Union, Tiffin Twp., Adams Co., Sept. 13, 1933, *Dodd* (OU); Defiance Co., June 18, 1897, *Fullmer* (OU); near South Charleston, Clark Co., June 21, 1930, *Gordon & Chapman* (OU); upper Sandusky, Wyandot Co., Sept. 18, 1930, *Hicks* (OU); Pront's, Erie Co., June 9, 1895, *Mosely* (GH); Oxford, Erie Co., July 8, 1895, *Mosely* (USN,OU); Miami, Sartwell (GH); Madison Co., July 12, 1920, *Taylor* (OU); Dunn's Prairie, Madison Co., Sept. 1, 1928, *Thomas* (OU).

MICHIGAN: roadside, 2 or 3 mi. northeast of Schoolcraft, Kalamazoo Co., June 23, 1937, *Anderson & Peck* (MBG); roadside south of Bronson, Branch Co., July 6,

1929, *Brown 2603* (WU); near Parma, Jackson Co., July 8, 1896, *Camp & Camp* (UM, UW).

INDIANA: clay hills near lakes in Jackson Twp., Wells Co., July 25, 1897, *Deam* (IU); high bank on east side of lakes in Jackson Twp., Wells Co., June 26, 1904, *Deam* (USN); in prairie condition near Clear Lake, Steuben Co., July 4, 1904, *Deam* (IU); on wooded sand dune near Hammond, Lake Co., Aug. 5, 1906, *Deam 1428* (IU); wooded sand dunes between Pine and Gary, Lake Co., July 28, 1907, *Deam 2344* (IU); in open wooded pasture about 4 mi. north of Goshen, Elkhart Co., June 23, 1910, *Deam 6758* (CD); rather dry woods about 2 mi. west of Hovey Lake, Posey Co., May 23, 1911, *Deam 8299* (IU); not frequent, in dry soil, along the Lake Erie RR. about 2 mi. north of Rochester, Fulton Co., June 25, 1911, *Deam 3902* (CD); not frequent, in open sandy woods about 2 mi. south of Culver, Marshall Co., July 2, 1911, *Deam 9064* (IU); in sandy soil on the exposed bank of Fishtap Lake near Laporte, Laporte Co., Aug. 13, 1911, *Deam 9609* (IU); in prairie habitat along the right-of-way, Lake Erie RR. west of Goldsmith, Tipton Co., July 9, 1913, *Mrs. Deam 13,636* (IU); roadside  $4\frac{1}{2}$  mi. southwest of Hanover, Jefferson Co., June 21, 1915, *Deam 16,256* (CD); open white oak ridge about  $\frac{1}{2}$  mi. south of Lake Galacia about 5 mi. northeast of Fairmount, Grant Co., July 1, 1916, *Deam 20,625* (CD); in an open sandy black- and white-oak woods  $1\frac{1}{2}$  mi. east of Mongo, Lagrange Co., July 9, 1916, *Deam 20,699* (CD); rocky bar of Wabash River 3 mi. west of Huntington, Huntington Co., July 23, 1916, *Deam 20,766* (IU); in white oak woods bordering the east side of New Lake, Whitley Co., Sept. 12, 1916, *Deam 21,783* (IU); in hard clay soil along roadside through the "flats" 1 mi. north of Midway, Spencer Co., June 9, 1918, *Deam 25,265* (IU); right-of-way, Vandalia RR. near Haekland about 7 or 8 mi. northeast of Terre Haute, Vigo Co., July 5, 1918, *Deam 25,787* (IU); roadside along Pine Creek about  $1\frac{1}{2}$  mi. south of Rainsville, Warren Co., July 8, 1919, *Deam 25,877* (IU); right-of-way of the Penn. RR., 2 mi. east of Burnettsville, July 9, 1918, *Deam 26,905* (CD); in sterile soil on the crest of the wooded Van Buren ridge about 7 mi. east of Cannellton, July 22, 1919, *Deam 28,464* (IU); sandy roadside 8 mi. northeast of South Bend, St. Joseph Co., July 8, 1920, *Deam 31,388* (IU); dry hard clay roadside 1 mi. northeast of Crisman, Porter Co., July 10, 1920, *Deam 31,568* (IU); wooded sand hill about  $\frac{1}{2}$  mi. southwest of Schneider, Lake Co., July 12, 1920, *Deam 31,648* (IU); black oak woods 4 mi. southwest of Lake Village, July 13, 1920, *Deam 31,632* (IU); black oak woods 3 mi. west of Gifford, Jasper Co., July 14, 1920, *Deam 31,747* (IU); pin- and black-oak woods about  $5\frac{1}{4}$  mi. southeast of North Judson, Starke Co., July 14, 1920, *Deam 31,833* (IU); right-of-way of the Penn. RR. about 3 mi. east of Monticello, White Co., Aug. 4, 1923, *Deam 39,347* (IU); in the old lake bottom of the east side of Bear Lake about  $1\frac{1}{2}$  mi. southwest of Wolf Lake, Noble Co., June 25, 1929, *Deam 47,035* (IU); roadside 1 mi. northeast of Otwell, Pike Co., Aug. 12, 1932, *Deam 52,673* (IU); open place in H. H. Peele woods, 1 mi. southwest of Knox, Starke Co., June 24, 1938; *Deam 58,992* (MBG); Lake Maxinkuchee, July 17, 1899, *Evermann 754* (USN); Hanover, July 1887, *Kearney* (OU); common in pasture, Sleek's farm  $\frac{3}{4}$  mi. east of Yockey, Lawrence Co., June 25, 1933, *Kriebel 708* (CD); open sandy woods, East Chicago, July 8, 1903, *Lansing 2586* (GH); along beach, Michigan City, July 8, 1903, *Mell 126* (USN); Chain Lakes, Oct. 10, 1912, *Nieuwland 10372* (USN); Knox, June 1926, *Rhoades* (UW); clay soil, old field west of Buttermilk Creek, Sullivan Co., July 1, 1928, *Steiner 5608 & 5609* (IU); sandy woods, Clarke, July 11, 1895, *Umbach 641* (UW); dry sands,

Clarke, June 15, 1895, *Umbach* (UM); woods, Clarke, June 30, 1897, *Umbach* (MBG); wood, Clarke, July 9, 1897, *Umbach* (GH); woods, Miller's, June 23, 1898, *Umbach* 7879 (UW); dunes, Aetna, July 7, 1900, *Umbach* 11185 (UW); swales, Pine, June 16, 1906, *Umbach* 1056 (22471) (UW); swales, Clarke, June 21, 1909, *Umbach* 3500 (31509) (UW); low meadow, Miller's, June 29, 1909, *Umbach* 3599 (31508) (UW); ½ mi. west of Fountain Park, roadside, Jasper Co., 1923, *Welch* 5818 (IU).

TENNESSEE: sandy fields, Henderson, May 1893, *Bain* 401 (NYB).

WISCONSIN: Galesville, Trempealeau Co., July 9, 1932, *Anthony* (UW); roadside, Montfort, Grant Co., June 28, 1929, *Breaker* (UW); open field, Hinsdale, Cook Co., July 28, 1926, *Churchill* (GH); Baraboo, July 1885, *Curtis* (UW); Racine, July 9, 1880, *Davis* (UW); Hollandale, Iowa Co., Aug. 14, 1927, *Davis* (UW); Lynxville, Sept. 1, 1915, *Denniston* (UW); Iron Dell north of Mirror Lake, Sauk Co., July 13, 1903, *Eggert* (MBG); Lake Denoon, Muskego, Waukesha Co., July 11, 1928, *Ehrlers* (UW); sand plain, north of La Crosse, La Crosse Co., Aug. 31, 1927, *Fassett* 4367 (UW); sandy roadside 2 mi. northwest of Pepin, Pepin Co., Aug. 7, 1934, *Fassett* 17782 (UW); roadside, prairie relic, New Diggings, Lafayette Co., Aug. 17, 1934, *Fassett* 16664 (UW); roadside & pasture, (T.8N., R.5W.), Eastman, Crawford Co., Aug. 13, 1934, *Fassett* 16648 (UW); RR., Liberty, Grant Co., Aug. 15, 1934, *Fassett* 17786 (UW); sandy woods near White River between Berlin & Princeton, Green Lake Co., Sept. 12, 1934, *Fassett* 16536 (UW); sandy roadside 5 mi. north of Peysippi, Waushara Co., Sept. 14, 1934, *Fassett* 16538 (UW); roadside, Sprague, Juneau Co., Sept. 17, 1934, *Fassett* 16534 (UW); sandy roadside, Lemonweir, 5 mi. southeast of Mauston, Sept. 17, 1934, *Fassett* 16535 (UW); sandy roadside near Port Hope, about 8 mi. north of Portage, Marquette Co., Sept., *Fassett* 16539 (UW); 3 mi. north of Cassville, Sept. 28, 1934, Grant Co., *Fassett* 17783 (UW); sandy roadside near Silver Lake, Wild Rose, Waushara Co., June 30, 1935, *Fassett* 17789 (UW); shore of Lake St. Croix near Pierce Co. line, St. Croix Co., Aug. 21, 1935, *Fassett* 17772 (UW); Wisconsin River bottoms east of Necedah, Adams Co., Oct. 7, 1934, *Fassett & Bushnell* 16573 (UW); between Camp Douglas & Tomah, Oakdale, Monroe Co., Oct. 7, 1934, *Fassett & Bushnell* 16730 (UW); sandy soil, mouth of Beef River, Alma, Buffalo Co., Aug. 13, 1926, *Fassett & Hotchkiss* 3099 (GH, UW); roadside, Winchester, Winnebago Co., Oct. 26, 1935, *Fassett & McGraw* 17776 (UW); roadside east of Lancaster, Grant Co., May 31, 1930, *Fernholz & Wadmond* (UW); Madison, *Hale* (UW); farm land through woods 2 mi. east and 16 mi. south of Babcock, Wood Co., June 21, 1936, *Hamerstrom* (UW); prairies and opening, Milwaukee Co., July 1882, *Hasse* (NYB); in an uncared-for, blue-grass yard on northern bluff of Lake Wingra, Madison, July 8, 1907, *Heddle* 544 (UW); open, rocky woods on summit of slope of the west mound near Blue Mounds, Iowa Co., July 1, 1919, *Heddle* 2719 (UW); Winnebago Co., June, *Kellerman* (UW); rocky bank at Jim Falls, Chippewa Co., July 8, 1928, *Kuns* 8 (UW); Milwaukee, *Lapham* (UW); Camp Douglas, July 14, 1890, *Mearns* 224 (USN); Beloit, July 3, 1895, *Olds* 32 (UW); rocky banks of Chippewa River, north of Chippewa Falls, July 9, 1915, *Rosendahl & Butters* 3061 (UM); Poynette, July 8, 1886, *Russell* (UW); Madison, June 14, 1885, *Smith* (UW); Janesville, June 25, 1889, *Skavlem* (UW); Black River Falls, Jackson, June 27, 1922, *Smith* 6804 (UW); Tuffa Falls, Grant Co., July 31, 1922, *Smith* 7835 (UW); sandy soil near Buffalo Lake, Montello, Marquette Co., Sept. 18, 1929, *Uhler & Warren* (UW); Blue Mounds, June 19, 1886, *Williamson* (UW).



ILLINOIS: Riverside, June 8, 1871, *Babcock* (NYB); prairies, Holcomb, July 1, 1907, *Beck 26908* (UW); prairies, Riverside, Cook Co., May 22, 1912, *Braun* (LB); old fields, Auburn, Aug. 1882, *Bigler* (GH); dry prairie, Akron Twp., Peoria Co., *Chase 4143* (UW); dry prairie northwest of Princeville, June 30 and July 15, 1898, *Chase 107* (NM); open field, Hinsdale, Cook Co., July 28, 1926, *Churchill* (MBG); Decatur, June 22, 1899, *Clokey* (MBG); prairie north of Prairie du Pont, July 2, 1878, *Eggert* (MBG); wet prairies, St. Clair Co., July 2, 1878, *Eggert* (GH); Bluff Lake, July 27, 1878, *Eggert* (MBG,UT); gravelly banks of Desplains River, Leyden Twp., Cook Co., June 17, 1905, *Gates* (USN); in prairie along roadside, Carthage, Hancock Co., Sept. 22, 1917, *Gates 10861* (MBG); dry upland woods, Mohamet, June 1902, *Gleason* (GH); Ottawa, *Huett* (GH); Quercus Lake, Clinton Co., May 20, 1917, *Ledman* (MBG); prairie west of Melrose, June 15, 1894, *Moffatt 645* (UW); prairies near Oquawka, Aug., *Patterson* (MBG); prairie, Bloomington, July 1886, *Robinson* (GH); rich prairie soil in sunny situations, Hendrix, Aug. 31, 1904, *Robinson* (GH); Bogota, July 6, 1926, *Schallert* (DU); Indian Creek region, vicinity of Concord, Morgan Co., Aug. 20, 1910, *Steele* (USN); fields, Palos Park, June 27, 1900, *Umbach 11501* (UW); fields, Beach, July 3, 1909, *Umbach 3717 (31510)* (UW); Jubilee, 1888, *Van Rensselaer* (GH); Ringwood, *Vasey 1182* (MBG); Chicago, Jan. 1888, *Williamson* (ANSF).

MINNESOTA: Rochester, June 22, 1904, *Amslie* (UM); Zumbrota, Goodhue Co., June 1893, *Ballard* (USN,GH,UM,UW); Winona, July 1912, *Freiberg* (MBG); Houston Co., Aug. 1912, *Freiberg* (MBG); sand prairie about 2 mi. north of Weaver, Wabasha Co., Sept. 21, 1930, *Hotchkiss & Jones 4159* (USN); Washington P.O., July 16, 1875, *Leonard* (UM); near Lake City, June 30, 1886, *Manning* (UM); White Rock, July 1881, *Sandberg* (UM); thickets, Hennepin, July 1890, *Sandberg* (UM); alluvial soil, Hennepin, July 1890, *Sandberg* (UM); White Bear Lake, July 16, 1888, *Schuette* (NYB); Minneapolis, July 7, 1884, *Roberts* (UM); Spring Grove, June 8, 1902, *Rosendahl 401* (UM).

Iowa: rich soil, Decatur Co., July 21, 1904, *Anderson* (MBG); Black Hawk Co., *Burk* (MBG); Vinton, *Davis* (UW); clay terrace, (Sect. 5T.95N.,R.3W.), Marquette, Clayton Co., *Fassett 4365* (UW); high ground, Fayette Co., June 1893, *Fink 578* (USN); common in fields, Decatur Co., June 7, 1896, *Fitzpatrick & Fitzpatrick* (MBG,GH); woods and pastures, Bentonport, June 1920, *Graves 1704* (MBG); Ames, *Hitchcock* (MBG); Ames, July 10, 1907, *Jeffs* (UO); Grinnell, Aug. 9, 1892, *A. J. Jones* (MBG); Grinnell, June 1877, *M. E. Jones* (USN, NYB); Des Moines, July 1895, *Mosier* (USN); open sunny hillsides, McGregor, Aug. 21, 1925, *Pammel 676* (MBG,GH); Polk Co., July 6, 1927, *Pammel* (UM); common, Iowa drift sheet, Grundy Center, June 23, 1925, *Pammel & Zimmerman 327* (GH); Fayette, *Parker* (UM).

MISSOURI: dry field, Leffingwell Ave., Kirkwood, July 11, 1936, *Ammerman* (MBG); Greene Co., July 29, 1893, *Blankinship* (GH); Jackson Co., July 6, 1892, *Bush* (MBG); common, Montier, May 15, 1894, *Bush 87* (MBG); common, Little Blue, Jackson Co., May 24, 1896, *Bush 311* (MBG); common in woods, Swan, June 6, 1899, *Bush 74* (MBG); prairies, Converse, July 12, 1930, *Bush 11854* (MBG); barrens, Eagle Rock, May 9, 1936, *Bush 15387* (MBG); Munger, Iron Co., May 29, 1937, *Chandler 2635* (MBG); roadsides, Whiteside, July 26, 1914, *Davis 3773* (MBG); meadows near Oakwood, Ralls Co., July 16, 1915, *Davis 609* (MBG); wet prairies, Whiteside, Sept. 17, 1916, *Davis 1714* (MBG); roadside, Whiteside, Lincoln Co., Sept. 17, 1916, *Davis* (UT); waste fields,



Eolia, Pike Co., July 29, 1918, *Davis 3151* (MBG); Springfield, July 31, 1892, *Dewart 101* (MBG); Graniteville, May 27, 1916, *Drushel* (MBG); dry hills north of Keren, St. Francois Co., July 3, 1892, *Eggert* (MBG); prairies, St. Louis, Aug. 1845, *Engelmann* (MBG); meadows, St. Louis, June 29, 1860, *Engelmann* (MBG); Bridgeton, July 16, 1859, *Fritchey* (MBG); St. Louis, July 21, 1894, *Glatfelter* (MBG); banks of Stout Creek, the Shut-In, Iron Co., May 25, 1918, *Greenman 3891* (MBG); Lake Killarney, Iron Co., May 8, 1925, *Greenman 4786* (MBG); St. Francois River near Silver Mine, Madison Co., May 20, 1927, *Greenman, Kobuski & Larsen* (MBG); Allenton, July 17, 1884, *Kellogg* (MBG); Jerome, May 28, 1914, *Kellogg 103* (MBG); Rolla, Phelps Co., May 20, 1928, *Kellogg 1799* (MBG); along RR., Eolia, Pike Co., July 17, 1930, *Kellogg 15217* (MBG); hillsides and RR. embankment 1 mi. south of Cedar Gap, Ozark Mtns., May 22–June 3, 1911, *Lansing 2986* (USN,GH); sandy banks of St. Francois River above concrete bridge at Silver Mine, Iron Co., May 9, 1936, *Larisey 1 & 2* (MBG); Allenton, May 10, 1896, *Letterman* (MBG); along RR. tracks on Highway 66, 3 mi. east of city limits of Cuba, Crawford Co., May 29, 1937, *Lodewyks 368* (MBG); Peruque, July 20, 1919, *McAttee 3013* (USN); common in low prairies and woods, Adams, Jackson Co., June 13, 1897, *Mackenzie* (MBG,UM); frequent on moist prairies, Webb City, Jasper Co., July 10, 1909, *Palmer 2464* (MBG); meadows and roadsides, black alluvial soil, Mississippi River bottoms 10 mi. south of Alexandria, Clark Co., June 26, 1933, *Palmer & Steyermark 40629* (MBG); St. Louis, 1843, *Riehl 421* (NYB); wet boggy ground, Buzzard Mtn., Iron Co., Aug. 1897, *Russell* (MBG); St. Louis Co., west of St. Louis, Sept. 7, 1905, *Shannon 201* (MBG); open field, vicinity of Strafford, Greene Co., Aug. 27, 1912, *Standley 9454* (USN); on low alluvial flood plain near Missouri River, 12 mi. northeast of St. Charles near Portage des Sioux, St. Charles Co., June 1, 1929, *Steyermark 1563* (MBG); on sand bars of Little St. Francis River near Silver Mine, Madison Co., Nov. 9, 1930, *Steyermark 1471* (MBG); rocky gravel of creek bed along Warm Branch of Spring River about 5 mi. north of Koshkonong, Oregon Co., Aug. 9, 1934, *Steyermark 14379* (MBG,USN); low woods along Mud Creek, T.26N.,R.7E., Sect.20, 2 mi. northwest of Rombauer, Butler Co., June 30, 1936, *Steyermark 11293* (MBG); gravel bar along headwaters of Mera-mee River, T.33N.,R.4W., Sect.14, 2 mi. southeast of Max, Dent Co., Aug. 10, 1936, *Steyermark 12825* (MBG); Reservoir, Joplin, Jasper Co., Oct. 7, 1897, *Trelease 198* (MBG); Lake Killarney, Iron Co., May 8, 1925, *Woodson 259* (MBG); Kirkwood, July 18, 1926, *Woodson 740* (MBG).

ARKANSAS: along RR. 4 mi. northeast of Texarkana, Miller Co., May 20, 1938, *Cutler* (MBG); sandy prairies, Fayetteville, July, *Harvey 16* (UM); prairies, northwest Arkansas, July, *Harvey 16* (GH); Stuttgart, May 12, 1910, *Howell 644* (USN); on roadside, 6 mi. west of Mount Ida on Highway 270, Montgomery Co., April 27, 1935, *Lodewyks 176* (MBG); no definite locality, *Pitcher* (NYB); Benton Co., 1899, *Plank* (NYB); dry woods, Winslow, May 22, 1920, *Wheeler* (NYB).

NEBRASKA: Saline Co., June 28, 1873, *Aughey* (UN); Ames, Story Co., June 1869, *Bessey* (UN); Wild Cat Cave near Fort Dodge, Webster Co., Sept. 24, 1904, *Churchill 2054* (UN); rare, rich bottoms of Platte, June 7, *Hayden* (MBG); river bottoms, Nebraska City, May 31, 1889, *Lownes* (UN); scattered in low prairie near Ashland, Saunders Co., June 20, 1934, *Morrison 1093* (MBG,UN); Lincoln, Lancaster Co., June 1906, *Petersen* (UN); Crabbe's Mill road, Lincoln,

Lancaster Co., June 27, 1887, *Smith* (UN); Salt Creek near Asylum, Lincoln, Lancaster Co., July 1887, *Smith* (UN); low prairie northeast of Havelock, July 14, 1928, *Steiger* (UN); Lincoln, July 1888, *Webber* (MBG); prairies, Lincoln, Aug. 1889, *Webber 344* (GH); roadside prairie, Peru, June 12, 1933, *Winter 3* (USN).

KANSAS: near Randolph, July 1886, *Cleburne* (UN); Marshall Co., July 25, 1897, *Clothier & Whitford* (KA); Brown Co., July 29, 1897, *Clothier & Whitford* (KA); Doniphan Co., July 31, 1897, *Clothier & Whitford* (KA); Atchison Co., Aug. 2, 1897, *Clothier & Whitford* (KA); Linn Co., Aug. 9, 1897, *Clothier & Whitford* (KA); Bourbon Co., Aug. 11, 1897, *Clothier & Whitford* (KA); Crawford Co., Aug. 12, 1897, *Clothier & Whitford* (KA); Labette Co., Aug. 18, 1897, *Clothier & Whitford* (KA); Montgomery Co., Aug. 19, 1897, *Clothier & Whitford* (KA); Elk Co., Aug. 20 and 21, 1897, *Clothier & Whitford* (KA); Woodson Co., Aug. 29, 1897, *Clothier & Whitford* (KA); Coffey Co., Aug. 31, 1897, *Clothier & Whitford* (KA); prairie, Ellis Co., July 26, 1882, *Deane* (GH); prairie, Brown Co., Sept. 1925, *Garner* (KA); Allen Co., July 1890, *Hitchcock* (KA); Cherokee, Crawford Co., Aug. 1892, *Hitchcock* (KA); Eureka, Greenwood Co., Aug. 1892, *Hitchcock* (KA); Neosho Co., July 1896, *Hitchcock* (KA); Olathe, Johnson Co., July 7, 1887, *Kellerman* (MBG,KA); Columbus, Cherokee Co., July 13, 1887, *Kellerman* (KA); Burlingame, Osage Co., July 21, 1887, *Kellerman* (KA); dry prairie soil northeast of Keene, Wabaunsee Co., June 16, 1926, *Maus 113* (KA); open prairie north of Auburn, Shawnee Co., July 7, 1927, *Maus 848* (KA); near Belvue, Pottawatomie Co., July 29, 1896, *Nagle* (KA); wet soil, Pottawatomie Co., 1895, *Norton 997* (MBG,GH,KA,NM); Wabaunsee Co., July 14, 1893, *Carlton* (KA); near St. Mary's, Pottawatomie Co., July 4, 1895, *Norton & Clothier* (KA); near St. Mary's in Jackson Co., July 4, 1895, *Norton & Clothier* (KA); Topeka, July 16, 1879, *Popenoe* (KA); schoolhouse hill and town reservoir, Pleasanton, Linn Co., June 19, 1929, *Rydberg & Imler 65* (MBG).

OKLAHOMA: open woods north of Tecumseh, June 6, 1932, *Barkley 232* (UO); without definite locality, coll. of 1877, *Butler* (MBG); common on prairies, Sapulpa, July 22, 1894, *Bush 60* (MBG); open prairies, Wilburton, June 12, 1930, *Clark* (UO); roadside, high hill, Talihina, Le Flore Co., May 17, 1936, *Demaree 12702* (NYB); black sticky soil on gentle slope 3 mi. north of Sapulpa, Creek Co., June 13, 1931, *Fox 27* (UT); E. Latimer Co., May 5, 1935, *Goodman 2557* (GH); along roadside east of Bokchite, Cleveland Co., June 19, 1919, *Jeffs* (UO); unbroken moist prairie, T.12N., R.20E., Sect. 20, Muskogee Co., May 22, 1927, *Little 614* (UO); T.13N., R.18E., Sect. 24, Muskogee Co., June 12, 1927, *Little 1251* (UO); Shannon Ranch Spring, McCurtain Co., T.3S, R.24E., Sect. 28, June 7, 1930, *Little & Olmsted* (UO); prairie meadow 2 mi. west of Dawson, July 8, 1928, *Myers 118* (UO); common on prairie, 3 mi. east of Adel, July 12, 1905, *Van Fleet* (UO); roadside 3 mi. east of Miami, *Whaley 115* (UO).

TEXAS: along RR. 2 mi. east of Pine Island, Jefferson Co., April 20, 1936, *Anderson & Hubricht* (MBG); seen at edge of timbered rolling land, Orange, April 17, 1899, *Bray 54* (UT); Jacksonville, Cherokee Co., April 30, 1903, *Biltmore Herb.* (UM); near Turning Basin, Harris Co., April 14, 1934, *Cory 8120* (GH); dry prairies north of Polk, Bowie Co., June 13, 1898, *Eggert* (MBG); Dalby, May 1896, *Milligan* (MBG); along RR. between Grand Saline and Silver Lake, May 22, 1900, *Reverchon 1935* (MBG); low prairies, Silver Lake, May 22, 1900, *Reverchon 1935* (USN); San Jacinto, Harris Co., July 4, 1923, *Tharp 2316*

(USN,UT); Clyde, July 3, 1927, *Tharp 4739* (USN); Nacogdoches-Alto, June 15, 1931, *Whitehouse* (UT).

**28. *B. leucantha* Torr. & Gray var. *divaricata* Larisey, var. nov.<sup>32</sup>**

As the species except: less than 1 m. tall, darkening but apparently not blackening; stem slender, firm, scarcely ribbed, branches subdichotomous, divaricate, lateral ones drooping; petioles usually less than 5 mm. long, leaflets narrowly obovate to oblanceolate, mucronate, 2.5–3 cm. long; stipules setaceous, less than 3 mm. long, usually caducous; racemes slender, few-flowered, less than 2 dm. long; mature pod elliptic-oblongoid, firm, rugose, 2–2.5 cm. long, 0.8–1.5 cm. broad.

Distribution: prairies, southwestern Louisiana.

**CITATION OF SPECIMENS:**

LOUISIANA: prairie west of Crowley, Acadia Parish, July 16, 1935, *Brown 5308* (LU); prairies, Opelousas, June, *Langlois* (UW,TYPE).

**29. *B. leucantha* Torr. & Gray var. *pauciflora* Larisey, var. nov.<sup>33</sup>**

As the species except: less than 1 m. tall; stem slender, firm, lightly ribbed, branches subdichotomous, spreading-ascending; petioles not exceeding 5 mm. in length, leaflets obovate to oblanceolate, retuse, not more than 4 cm. long; stipules lanceolate to setaceous, 3–4 mm. long, usually persistent; racemes slender, few-flowered, less than 2 dm. long; mature pod ovoid to subglobose, inequilateral, firm but extremely brittle, 1.5–2 cm. broad, 2 cm. long.

Distribution: prairies, south-central Louisiana.

<sup>32</sup>Ab specie differt caulibus vix 1 m. altis postremo fuscis sed vix nigrescentibus, ramis gracilibus firmis vix striatis, ramulis subdichotomis divaricatis, lateralibus patulis; petiolis plerumque 5 mm. vel minus longis, foliolis anguste obovatis vel oblanceolatis 2.5–3.0 cm. longis, mucronatis, stipulis setaceis vix 3 mm. longis plerumque caducis; racemis gracilibus paucifloris vix 2 dm. longis; legumine maturo subcylindrico firmo rugoso 2.0–2.5 cm. longo 0.8–1.5 cm. lato.

<sup>33</sup>Ab specie differt caulibus vix 1 m. altis gracilibus firmis leviter striatis, ramis subdichotomis patulo-ascendentibus; petiolis circiter 5 mm. longis, foliolis obovatis vel oblanceolatis retusis 4 cm. longis vel brevioribus, stipulis lanceolatis vel setaceis 3–4 mm. longis plerumque persistentibus; racemis gracilibus paucifloris vix 2 dm. longis; legumine ovoideo vel subgloboso inaequilaterale firmo sed fragilissimo 2 cm. longo, 1.5–2.0 cm. lato.

## CITATION OF SPECIMENS:

LOUISIANA: common in prairies, Attakapas, "West La.," May 27, 1883, *Langlois 10* (NYB,TYPE); common, Attakapas, June 3, 1890, *Langlois 171* (UM).

**30. *B. psammophila* Larisey, sp. nov.<sup>34</sup>**

Plant usually more than 1 m. high, sometimes less, glabrous throughout; stem stout, fairly firm, heavily ribbed, blackening early, glaucous, simply branched, branches arising alternately from the primary stem, secondary and subsequent branches ascending, only rarely geniculate; leaves bright green, usually not blackening, petiolate, petioles 0.8–1.2 cm. long; leaflets broadly elliptic to obovate, occasionally oblanceolate, rarely cuneate, 4–6.5 cm. long, 2–3 cm. broad, delicate, finely reticulate, apex obtuse, rounded, or broadly acute, seldom retuse; stipules lanceolate, 0.8–1.2 cm. long, usually persistent, sometimes caducous; racemes terminal, erect, only rarely flexuous, compact, exceeding the foliage, 1–3.5 dm. long, flowers subverticillate; bracts lanceolate, 7–8 mm. long, usually caducous; pedicels 4–6 mm. long, slender; calyx black, glaucous, 0.9–1 cm. deep, upper lip entire, ovate, truncate, not usually emarginate, lobes of the lower lip deltoid to ovate, 3–3.5 mm. long; corolla white (?), standard 1.5–1.7 cm. high, 1.4–1.5 cm. wide, wings and keel 1.8–2.2 cm. long; pod black, glaucous, strongly reticulated, much inflated, oblong to subglobose, tapering gradually into a long stipe, 0.7–1.1 cm. in length, body

<sup>34</sup>Herba 1 m. plus minusve alta, omnino glabra. Caules crassiusculi sat firmi valde striati cito nigrescentes glauci haud dichotomi, ramis alternatis ascendentibus haud vel raro geniculatis. Folia viridia raro nigrescentia, foliolis late ellipticis vel obovatis vel oblanceolatis 4.0–6.5 cm. longis, 2–3 cm. latis delicate membranaceis reticulato-venosis, apice obtusis vel rotundatis vel acutis raro retusis basi cuneatis, petiolis 0.8–1.2 cm. longis, stipulis lanceolatis 0.8–1.2 cm. longis fere persistentibus. Racemi terminales erecti raro flexuosi compacti folia superantes 1.0–3.5 dm. longi, bracteis lanceolatis 7–8 mm. longis saepe caducis, pedicellis 4–6 mm. longis graciliusculis subverticillatis. Calycis tubum 0.9–1.0 cm. longum nigrum pruinosum, labro superiore integro ovato truncato raro emarginato, labri inferiori lobis deltoideis vel ovatis 3.0–3.5 mm. longis. Corolla albida (?), vexillo 1.5–1.7 cm. longo, 1.4–1.5 cm. lato, alis carinaque 1.8–2.2 cm. longis. Legumen oblongoideum vel subglobosum 3.5–4.0 cm. longum, 2.5–3.0 cm. latum apice abrupte breviterque sed anguste rostratum basi in stipitem angustum 0.7–1.1 cm. longum gradatim productum nigrum pruinosum conspicue reticulatum valde inflatum tenue in rugas profundas corruens.

3.5-4 cm. long, 2.5-3 cm. broad, abruptly short- and slender-beaked, pericarp thin, collapsing into deep folds.

Distribution: sandy pine lands, central Georgia south to northern Florida.

CITATIONS OF SPECIMENS:

GEORGIA: rich woodland, Augusta, April 24-May 26, 1900, *Cuthbert 180* (NYB); lowland woods between Montezuma and Oglethorpe, Macon Co., April 1, 1937, *Oosting 74* (DU); 9 mi. southeast of Valdosta, Lowndes Co., Mar. 19, 1938, *Pyron & McVaugh 2153* (MBG); dry roadside embankment, Ochlockonee River 5 mi. west of Thomasville, Thomas Co., Mar. 20, 1938, *Pyron & McVaugh 2206* (MBG); moist alluvial soil in woods 1 mi. north of River Junction, Florida (†), DeCATUR Co., Mar. 21, 1938, *Pyron & McVaugh 2249* (MBG); sandy ridge 8 mi. from Valdosta, April 19, 1933, *Totten* (UNC).

FLORIDA: moist soil, Westville, Holmes Co., April 18, 1899, *Biltmore Herb. 1597* (NYB); pine woods, Tallahassee, April 8, 1902, *Biltmore Herb. H/6046* (GH,TYPE, USN,NYB); high pineland 1 mi. south of Belleview, April 18, 1930, *Blanton 6387* (MBG); no definite locality, *Chapman* (NYB); Chattahoochee, *Chapman, Herb. No.792965* (MBG); Tologie Creek, Gadsden Co., 1889, *Chapman* (USN); open sandy woods, Alachua Co., March, *Curtiss 697* (UN,ANSP); in dry sandy field, Greenville, Madison Co., May 1, 1930, *Moldenke 1107* (MBG,NYB,DU); in pinelands 3 mi. west of Gainesville, Mar. 31, 1925, *O'Neill 619* (MBG); flat sandy prairies 5 mi. west of Tallahassee, Leon Co., April 11, 1931, *Palmer 38521* (MBG); Leon Co., Mar. 22, 1904, *Rehn* (ANSP); "ad rivulos, prope Tallahassee," April 1843, *Rugel* (MBG,NYB); hammock along Suwannee River near Withlacoochee Bridge, April 21, 1924, *Small, DeWinkeler, Mosier 11181* (NYB).

**31. *B. villosa*** (Walt.) Nutt. Gen. N. Am. Pl. 1: 281. 1818; Ell. Sketch Bot. S. Car. & Ga. 1: 468. 1821; DC. Prodr. 2: 100. 1825; Torr. & Gray, Fl. N. Am. 1: 384. 1840; Chapman, Fl. South. U. S., ed. 1, 111. 1860, ed. 2, 111. 1889, and ed. 3, 111. 1897; Britton & Brown, Illust. Fl. North. U. S., ed. 1, 2: 266, fig. 2051. 1897, in part, and ed. 2, 2: 345, fig. 2455. 1913, in part; Small, Fl. Southeast. U. S., ed. 1, 599. 1903, and ed. 2, 599. 1913; Gray, New Man. Bot., ed. 7, 506. 1908, in part; Small, Man. Southeast. Fl. 677. 1933.

*Sophora villosa* Walt. Fl. Car. 134. 1788.

*Podalyria villosa* Michx. Fl. Bor. Am. 1: 264. 1803; Pursh, Fl. Am. Sept. 1: 307. 1814, and ed. 2, 1816.

*Lasinia cinerea* Raf. New Fl. N. Am. 2: 50. 1836 [1837].

*Lasinia fulva* Raf. New Fl. N. Am. 2: 49. 1836 [1837].

Plant less than 1 m. high, tawny-pubescent throughout, villos when young, blackening; stem stout, heavily ribbed,



slightly twisted, with spreading-drooping, strongly geniculate branches; leaves short-petiolate, petioles stout, channelled, usually less than 5 mm. long; leaflets coriaceous, strongly reticulate, lustrous and glabrous above, elliptic to rhombic-elliptic, or individually oblanceolate or obovate, cuneate, tapering gradually toward base into a slender petiole, apex obtuse or broadly acute, rarely notched, usually apiculate, 6-9 cm. long, 2-3.5 cm. broad; stipules ovate to lanceolate, firm, reticulate, 5-10 mm. long, usually persistent, sometimes caducous; racemes terminal, erect or flexuous, 2-4 dm. long; floral bracts lanceolate, 7-9 mm. long, usually caducous, occasionally persistent; pedicels stout, 5-7 mm. long; calyx-tube 8-10 mm. deep, strongly reticulate, upper lip broadly truncate, slightly depressed, or occasionally emarginate, lobes of the lower lip deltoid to ovate, 3-4 mm. long; corolla yellow, standard 1.7-1.9 cm. high, 2 cm. wide, wings and keel 2-2.4 cm. long; ovary densely villous, mature pod somewhat ligneous, inflated, lustrous, sparsely pubescent, ellipsoid, 2.5-3 cm. long, 1.3 cm. broad, narrowing gradually into a slender beak.

Distribution: sandy woods and hills, coastal plain of Virginia, south to South Carolina.

CITATION OF SPECIMENS:

VIRGINIA: Franklin, coll. of 1867, *Canby* (GH).

NORTH CAROLINA: sandy woods, Wilmington, May 9, 1928, *Anderson* (MBG); sandy soil, White Hall, Bladen Co., June 19, 1897, *Biltmore Herb. 1262* (USN, NYB,UM); sandy soil, Fayetteville, June 12, 1902, *Biltmore Herb. 1262d* (NYB); dry sandy soil, Leland, Brunswick Co., May 10, 1931, *Blomquist 3895* (DU); in sand barrens near Raleigh, Wake Co., May 19, 1930, *Bright 2594* (CD); near Wilmington, May 1867, *Canby* (NYB,ANSP,FM); Weldon, July 1, 1878, *ex Herb. Canby* (GH,FM); no definite locality, *Herb. Chapman* (NYB); sand hills "across Lake," May 22, 1909, *Coker* (NYB); no definite locality, *Curtis* (MBG,NYB,WU); Wilmington, *Curtis* (GH); open sandy and peaty barrens about 4 mi. east of Bolivia, Brunswick Co., April 16, 1933, *Fogg 5490* (GH); on pocosin-savanna, Chowan Terrace at Angola Bay, Wilmington, New Hanover Co., April 16, 1938, *Moldenke (Friend) 10432* (NYB); Southern Pines, May 5, 1927, *Harriott* (ANSP); Statesville, *Hyams* (MBG,FM,UM); Bingham, June 1877, *Hyams* (USN); Burgaw, May 1880, *Hyams* (NYB,KA); Wilmington, Aug. 1880, *Hyams* (OU); Magnolia, Duplin Co., April 30, 1933, *Mathews* (DU); dry sandy pine woods west of Leland, Brunswick Co., May 15, 1930, *Moldenke 1236* (MBG,USN, NYB,DU); no definite locality, Aug. 2, *Nuttall* (ANSP); sandy area near White Lake, Bladen Co., May 12, 1934, *Oosting 34111* (DU); sandy turkey oak area, Sampson Co., May 12, 1934, *Oosting 34145* (DU); dry sandy soil, open scrub land



1½ mi. southeast of Kinston, Lenoir Co., July 9, 1922, *Randolph & Randolph* 565 (GH); low pine land, Nakina, May 1, 1929, *Schallert* (DU); Burgaw, July 1879, *Spence* (OU); dry sandy bank 3 mi. west of Sims, Wilson Co., June 25, 1927, *Wiegand & Manning* 1493 (GH); sandy field 1 mi. south of Hoffman, Richmond Co., July 1, 1927, *Wiegand & Manning* 1494 (GH); Hamlet, May 20, 1895, *Williamson* (NYB, ANSP).

SOUTH CAROLINA: Poston, April 21, 1924, *Benke* 3800-1 (FM); Camden, May 8, 1857, *Gibbes* (NYB); South Pines in eastern S. Car., 1889, *McCarthy* (USN); South Pines, Aug. 1889, *McCarthy* 9920 (WU); sand hills, Highland Farms, Hartsville, July 17, 1920, *Norton* (USN); Cherow, *Wallace* (CM).

**32. *B. tinctoria* (L.) Vent.** Dec. Gen. Nov. 9. 1808; R. Br. in Ait. Hort. Kew, ed. 2, 3: 6. 1811; Ell. Sketch Bot. S. Car. & Ga. 1: 467. 1821; DC. Prodr. 2: 100. 1825; Torr. & Gray, Fl. N. Am. 1: 386. 1840; Chapman, Fl. South. U. S., ed. 1, 111. 1860, ed. 2, 111. 1889, and ed. 3, 121. 1897; Britton & Brown, Illust. Fl. North. U. S., ed. 1, 2: 266, fig. 2050. 1897, in part, and ed. 2, 2: 345, fig. 2454. 1913, in part; Small, Fl. Southeast. U. S., ed. 1, 598. 1903, and ed. 2, 598. 1913; Gray, New Man. Bot., ed. 7, 506. 1908; Rydb. Fl. Prairies & Plains Central N. Am. 455. 1932; Small, Man. Southeast. Fl. 676. 1933.

*B. Gibbesii* Small, Fl. Southeast. U. S., ed. 1, 600, 1331. 1903, and ed. 2, 599. 1913; Small, Man. Southeast. Fl. 676. 1933.

*B. tinctoria* (L.) Vent. var. *Gibbesii* (Small) Fern. in Rhodora 38: 424. 1936.

*Sophora tinctoria* L. Sp. Pl. 1: 373. 1753; Walt. Fl. Car. 134. 1788.

*Podalyria tinctoria* Willd. in L. Sp. Pl., ed. 4, 2: 503. 1799; Michx. Fl. Bor. Am. 1: 265. 1803; Curt. Bot. Mag. 27: pl. 1099. 1808; Pursh, Fl. Am. Sept. 1: 308. 1814, and ed. 2, 308. 1816.

Plant 1 m. or less high, virtually glabrous, occasionally slightly pubescent in parts, blackening in drying; stem slender, firm, widely branched, branches arising alternately from a single primary stem, ascending; leaves subsessile to short-petiolate, petioles 2-3 mm. long, leaflets obovate, strongly cuneate, 1-1.5 cm. long, 0.6-1 cm. broad, rounded or obtuse at the apex, slightly retuse, lower surface delicately nerved; stipules minute, setaceous, deciduous; racemes numerous, terminating the branches, 0.7-1 dm. long; floral bracts lanceo-

late-setaceous, minute, deciduous; pedicels 4-5 mm. long; calyx-tube 3-4 mm. long, upper lip entire or slightly emarginate, lobes of the lower lip deltoid-acuminate, 1-1.5 mm. long; corolla yellow, standard 1 cm. high, 0.8-1 cm. broad, wings and keel 1.2-1.3 cm. long; mature pods subglobose to ovoid, strongly rounded at base and summit, contracted along the sutures, 0.7-0.9 cm. long, 0.6-0.8 cm. broad, black, glaucous, rugose to reticulate, slender-beaked, long-stipitate, stipe 3 times the length of the calyx.

Distribution: sandy ground and dry open woods, Massachusetts to Minnesota, southeast to South Carolina and Georgia.

CITATION OF SPECIMENS:

MASSACHUSETTS: Nantucket, July 1887, *Allen* (UW); near Boston, coll. of 1816, *Boott* (USN); Martha's Vineyard, July 16 & Aug. 18, 1892, *Curtiss* (UM); common near lagoon, Martha's Vineyard, *Drushel* 6267 (MBG); Beverly, Sept. 10, 1856, *Engelmann* (MBG); sterile hillside, Lunenburg, Worcester Co., July 12, 1930, *Fassett* 10610 (UW); Reading, July 24, 1882, *Manning* (NYB); along Edgarton Road, West Tisbury, Martha's Vineyard, Sept. 5, 1916, *Seymour* 1237 (NYB); Nantucket, July 23, 1890, *Wislizenus* 922 (MBG).

CONNECTICUT: Bates' Farm, North Haven, Oct. 4, 1913, *Bates* 5847 (UN).

NEW YORK: prairie, Hempstead Plains near Central Park, Cold Spring Harbor, Long Island, Aug. 6, 1934, *Cain* 7433 (IU); Babylon, southern Long Island, July 4-5, 1898, *Clute* 134 (NYB); Long Island, Aug. 13, 1891, *Schrenk* (MBG).

NEW JERSEY: dry open sandy places along Maurice River south of Millville, Cumberland Co., July 1, 1926, *Adams* 354 (CD); vacant lot near Roosevelt School, Westfield, July 18, 1927, *Drushel* 3302 (MBG); Spotswood, July 27, 1930, *Drushel* 6957 (MBG); pine barrens, Sept. 16, 1879, *Engelmann* (MBG); Cape May Co., Aug. 5, 1931, *Keeffe* (UW); sandy soil, East Orange, July 8, 1914, *Lighthipe* (MBG); dry sandy pine woods, Atsion, Burlington Co., June 22, 1922, *Long* 26855 (GH); sand-hills, South Amboy, Middlesex Co., July 30, 1905, *Mackenzie* 1558 (MBG); Peapack, *Perry* (MBG); woods, Elmer, Salem Co., July 4, 1874, *Redfield* 1186 (MBG).

PENNSYLVANIA: Tuscarora, Aug. 1824, *ex Bernhardt* Herb. (MBG); York Co., Sept. 1899, *ex Glatfelter* Herb. (MBG); Philadelphia, 1843, *Lea* (MBG).

DELAWARE: Sussex Co., July 13, 1878, *Canby* (GH).

MARYLAND: woods and fields, Mtn. Lake Park, July 25, 1906, *Braun* (LB); Black Ridge, near Swanton, Garrett Co., June 27, 1931, *Core* (NYB).

DISTRICT OF COLUMBIA: sandy soil, Brookland, Aug. 28, 1908, *Holm* (MBG); north of Brookland, Aug. 7, 1911, *Nieuwland* (MBG); dry hillsides near Rock Creek Park, Washington, Sept. 17, 1930, *Steyermark* 993 (MBG).

VIRGINIA: dry open woods, Clarendon, July 6 & Aug. 12, 1929, *Blake* 10857 (UT); Norfolk Co., June 27, 1872, *Curtiss* (MBG); clay field near Lynnhaven, Princess Anne Co., June 17, 1935, *Fernald, Griscom & Long* 4658 (GH); dry clearing bordering pine woods south of Kendall Grove, Northampton Co., Oct. 13, 15, 1935, *Fernald, Long, Fogg* 5319 (GH); argillaceous and siliceous boggy depres-

sion north of Gary Church, Prince George Co., June 25, 1936, *Fernald, Long & Smart 5804* (MBG,GH); on Round Top Mtn., west of Seven Mile Ford, Smyth Co., July 2, 1892, *Small* (MBG).

NORTH CAROLINA: Salem, July 1896, *ex Herb. Ashe* (MBG); dry woodland, Biltmore, Aug. 16, 1897, *ex Biltmore Herb. 137a* (NYB); dry woods, Waynesville, Haywood Co., July 18, 1930, *Blomquist 3894* (DU); dry open ground, Durham Co., Aug. 5, 1932, *Blomquist 3893* (DU); Weldon, July 1, 1878, *Canby* (GH); old field, dry soil, near Bear Creek, Chatham Co., June 14, 1935, *Correll 691* (GH); no definite locality, coll. of 1848, *Curtis mis.* (MBG); open pastures, Mt. Mitchell Station, McDowell Co., July 27, 1917, *Davis 7805* (MBG); dry woods, Flat Rock, Henderson Co., June 26, 1920, *Davis* (UM); Saluda, Polk Co., June 29, 1920, *Davis* (MBG); Mt. Mitchell, Aug. 19, 1925, *Kraus* (UW); east of Durham, Wake Co., July 1932, *Lynn* (DU); in dry soil, woods on old town road north of Winston-Salem, May 12, 1911, *Schallert 859* (DU); Grandfather Mtn. Forest, Aug. 12, 1890, *Sudworth 131* (USN); mtns. of western N. Car., coll. of 1926, *Trentham* (DU); sandy bank by roadside 4 mi. west of Raleigh, Wake Co., coll. of 1927, *Wiegand & Manning 1491* (GH).

SOUTH CAROLINA: Society Hill, July 1, 1878, *Canby* (GH); sandy woods north of Graniteville, Aiken Co., Aug. 6, 1898, *Eggert* (MBG); sandy ground north of King Station, Aiken Co., May 24, 1899, *Eggert* (MBG); no definite locality, *ex Herb. Ell.* (CM); Caesar's Head, Aug. 7, 1912, *Gaillard & Bragg 3672 & 3673* (CM); Abbeville, *Hezamer & Maier* (GH); no definite locality, coll. of 1834, *Gibbes* (NYB,COTYPE of *B. Gibbesii* Small); Charleston, July 10, 1861, *Manigault* (NYB,TYPE of *B. Gibbesii* Small); Seneca, June 1888, *McCarthy* (USN); Steadman's Pond, vicinity of Batesburg, Lexington Co., May 30, 1913, *McGregor 162* (USN); dry open woods near Clementia Tourist Camp, 14 mi. south of Charleston, Charleston Co., May 14, 1930, *Moldenke 1220* (MBG,DU); Aiken, Aug., *Ravenel* (NYB); Santee Canal, *Ravenel* (CM); Aiken, June 1869, *Ravenel* (USN); Cooper River, May 1848, *Wallace* (CM).

GEORGIA: sandy ground north of Tucker, Richmond Co., May 22, 1899, *Eggert* (MBG); dry pine woods near Belair, Richmond Co., June 10, 1902, *Harper 1315* (USN,GH); Tallulah Falls, June 14, 1911, *Reade E3390* (UG); open woodland, Athens Y Camp, Tallulah Falls, July 14, 1929, *Reade E3371* (UG); Blue Ridge Mtns., Fannin Co., July 22, 1909, *Smith 2465 & 2544* (UW).

FLORIDA: "in pinetia, prope Quincy," May 1843, *Eugel* (MBG).

OHIO: Parma, July 1897, *Ashcroft* (MBG,UM); Sheffield, Lorain Co., Aug. 12, 1895, *Dick* (USN,OU); Turkey Creek road near base of Divide, Sciota Co., July 16, 1927, *Harper* (OU); Oak Harbor, Aug. 1927, *Moore* (UO).

WEST VIRGINIA: Rhododendron Nursery near White Sulphur Springs, Greenbrier Co., July 24, 1930, *Berkley 1240* (MBG); near Bucklin, Upshur Co., July 16, 1894, *Pollock* (MBG,KA).

INDIANA: Gary, Lake Co., July 5, 1930, *Standley 57413* (CD); on sandy road, 2-3 mi. northeast of Tefft, Jasper Co., July 10, 1924, *Welch 5211* (IU).

MINNESOTA: Lake City, July 24, 1882, *Sandberg* (UM).

### 33. *B. tinctoria* (L.) Vent. var. *crebra* Fern. in *Rhodora* 39: 415. 1937.

As the species except: plant larger and coarser in general

habit; leaflets 2-4 times as large, 1.5-4 cm. long, 0.8-1.8 cm. broad; flowers 1.3-1.6 cm. long; pods ovoid to elliptic, attenuate at base and apex, 0.8-1.5 cm. long.

Hybridizes with *B. alba* in Virginia, and with *B. leucantha* in Indiana.

Distribution: dry woods, Maine to Minnesota, south to North Carolina and Tennessee.

CITATION OF SPECIMENS:

MAINE: dry woods, mixed hardwood, Alfred, Shaker Hill, York Co., July 23, 1936, *Steinmetz* (GH).

VERMONT: shade of oaks, Pownal, Bennington Co., Aug. 13, 1902, *Blanchard* (GH); Pownal, rare in S. Vt., July 29, 1898, *Eggleston & Churchill* (MBG).

MASSACHUSETTS: Wellesley, Sept. 4, 1915, *Anderson 2401* (IU); Springfield, Hampden Co., July 27, 1903, *Burnham* (GH); scarce, moist shady road, Sheffield, Berkshire Co., Aug. 8, 1920, *Churchill* (MBG,GH); New Bedford, *Greene* (UW); near Hyannisport, Cape Cod, Sept. 5, 1898, *Greenman 458* (MBG,GH); Milton, Aug. 6, 1899, *Greenman 2279* (MBG); Canton, Aug. 8, 1887, *Kennedy* (GH); Springfield, July 10, 1928, *Lyman* (UW); Newton, Oct. 5, 1889, *Pound* (UN); Beverly, July 5, 1895, *Rich* (UN); dry woods, Lincoln, Aug. 15, 1896, *Rich* (GH); along Edgarton Road west of Tisbury, Martha's Vineyard, Sept. 5, 1916, *Seymour* (GH); open spots in deciduous woods, Wilbraham Mt., Wilbraham, Hampden Co., July 26, 1927, *Seymour 679* (GH,TYPE, MBG); Hyde Park, July 1891, *Tower* (NM).

RHODE ISLAND: fields east of cut swamp, Providence, Aug. 11, 1893, *Collins* (GH); Providence, *Olney* (GH).

CONNECTICUT: New Haven, July 7, 1879, *Allen* (GH); common, sandy woods, Southington, Sept. 10, 1897, *Bissell 514(42)* (MBG); dry field, Stratford, July 22, 1898, *Eames 1* (GH).

NEW YORK: dry thickets south of sand dunes by Lake Ontario, Selkirk, Oswego Co., Aug. 23, 1922, *Fernald, Wiegand, Eames 14356* (GH); New Dorp, Long Island, Sept. 30, 1894, *Kearney* (OU); Shrub Oak, July 31, 1887, *Martens* (GH); Canarsie, Brooklyn, July 7, 1936, *Monachino 84* (GH,UT).

NEW JERSEY: sandy roadside bank, margins of damp woods 0.75 mi. northwest of Shiloh, Cumberland Co., July 24, 1927, *Adams 863* (MBG); Califon, Hunterdon Co., July 12, 1902, *Fisher* (UW); dry pine woods, Cape May Point, July 8, 1922, *Fogg 162* (GH); in sand along ocean front, Cape May, Aug. 17, 1917, *Gershey 356* (GH); Orange, Aug. 5, 1914, *Lighthipe* (UT); vicinity of Clifton, Passaic Co., July 19, 1891, *Nash* (KA); Franklin, July 1879, *Busby 692* (UM); Summit, Aug. 3, 1907, *Eydberg 8000* (NYB); in dry ground, Pleasantville, July 10, 1923, *Tidestrom 11399* (GH).

PENNSYLVANIA: sandy ground, Grove City, Mercer Co., July 18, 1900, *Barbour 4* (KA); Mount Gretna, July 19, 1889, *Fritchey* (MBG); Lancaster Co., June 8, 1883, *Galen* (MBG); Loganville, Oct. 1, 1892, *ex Herb. Glatfelter* (MBG); Philadelphia, 1889, *Greenman 970* (GH); no definite locality, 1844, *Lea* (MBG); woods, lower Merson, July 2, 1871, *Redfield* (MBG); Smithville Swamp, Lancaster Co., July 23, 1889, *Small* (MBG); Lancaster, July 8, 1874, *Stevens* (MBG).

DELAWARE: dry woods, Greenbank, July 24, 1883, *Cummins* (MBG,GH); in woods west of Wilmington, Aug. 1, 1923, *Tidestrom 11514* (GH).

MARYLAND: Elk Neck, Cecil Co., June 18, 1923, *Abbott* (GH); Deep Creek Lake region, Garrett Co., Aug. 5, 1937, *Bright 15565* (UT); among pines, Armiger, July 8, 1924, *Tidestrom 12254* (GH).

DISTRICT OF COLUMBIA: woods, July 4, 1890, *ex Herb. Blanchard* (UM); Washington, July 16, 1891, *Blanchard* (MBG); woods near Eckington, July 15, 1893, *Boettcher 137* (MBG); coll. of 1881, *Canby* (UN); rocky woods south of Chevy Chase, July 18, 1904, *Chase 2492* (UM); frequent in woods near Washington, July 1, 1880, *Holm* (GH); sand hills near Terra Cotta, July 1910, *Holm* (MBG); in sandy soil, Brookland, May 1911, *Holm* (MBG); near West Gate, Soldiers' Home, June 25, 1897, *Kearney* (OU); July 7, 1843, *McCarthy & Schuette* (UM); dry thickets and woods, July 25, 1896, *Steele* (MBG,DU,UM); Oxen Hill, June 16, 1895, *Topping* (UM); coll. of 1875, *Vasey* (OU).

VIRGINIA: dry soil, Clifton Forge, June 29, 1903, *Biltmore Herb. 137b* (OU); Arlington, June 21, 1890, *Blanchard* (MBG); dry mixed woods, Little Neck, Princess Anne Co., Aug. 8 & 9, *Fernald & Long 3972* (GH); dry clearing bordering pine woods south of Kendall Grove, Northampton Co., Oct. 13-14, 1935, *Fernald, Long & Fogg* (GH); dry pasture, Elkins, Randolph Co., Sept. 22, 1904, *Greenman 185* (GH); in open stand of *Pinus Taeda* 3.5 mi. north of Accomac, Accomac Co., June 29, 1928, *Jones* (MBG); Round Top Mtn., west of Seven Mile Ford, Smyth Co., July 2, 1892, *Small* (NYB); vicinity of Stony Mtn., near Luray, Aug. 20, 1901, *Steele & Steele 42* (UM).

NORTH CAROLINA: rocky woods, Balsam, July 19, 1911, *Braun* (LB); face of mountain above Tuckaseegee Falls, Jackson Co., July 4, 1934, *Clabough 56* (DU); Flat Rock, Henderson Co., June 26, 1920, *Davis* (MBG,UT); Saluda, Polk Co., June 27, 28, 29, 1920, *Davis* (MBG,UM,UT); Saluda, July 30, 1912, *Davis 1493* (MBG); Asheville, June 1925, *Kraus* (UW); Sapphire, July 20, 1901, *Magee* (GH); open woods 9 mi. west of Hayesville, Trout Cove Creek, Clay Co., July 8, 1934, *Oosting 34584* (DU); dry shaley slope, Nantahala Gorge, road to Robbinsville, July 8, 1934, *Oosting 34631* (DU); dry sterile soil, edge of woods, 2 mi. southeast of Granite Falls, Caldwell Co., July 30, 1922, *Randolph & Randolph 1067* (GH).

ONTARIO: sandy swamps near Leamington, western Ontario, June 1, 1882, *Macoun 564* (NYB); sandy woods, Windsor, Sept. 16, 1884, *Macoun* (GH); Sandwich, July 25, 1901, *Macoun 34197* (GH).

OHIO: common in copses near Toledo, Lucas Co., June 1898, *Burglehaus* (OU); abundant locally, Stanhope Gorge, Williamsfield Twp., Ashtabula Co., Sept. 4, 1928, *Hicks* (OU); Niles, Trumbull Co., July 31, 1891, *Ingraham* (OU); Bowling Green, Wood Co., Sept. 2, 1901, *Kellerman* (OU); Collmer, Cuyahoga Co., July 18, 1895, *Stair* (OU); Neopolis, Lucas Co., Aug. 16, 1897, *Schultz* (OU); Brady's Lake, Portage Co., July 12, 1902, *Webb 534* (GH); Painesville, Lake Co., July 1892, *Warner* (OU).

WEST VIRGINIA: open woods, Buckhannon, Upshur Co., July 11, 1890, *Mills-paugh 399* (NYB); Upshur Co., July 9, 1896, *Pollock* (MBG,KA).

MICHIGAN: north of Wayne, Wayne Co., Aug. 11, 1929, *Brown 2744* (UW); dry soil, Jackson Co., July 17, 1894, *Camp & Camp 642* (UM,UW); St. Clair-Algonac, St. Clair Co., July 11, 1894, *Dodge* (UT); near Port Huron, St. Clair Co., July 27, 1894, *Dodge 6468* (UM,UW); Arboretum, Ann Arbor, Washtenaw Co., Aug. 14, 1915, *La Rue* (KA).



INDIANA: prairie 0.5 mi. north of Clear Lake, Steuben Co., July 24, 1904, *Deam* (MBG,CD); flat woods on southeast border of Bass Lake, Starke Co., Aug. 20, 1915, *Deam* 17,971 (GH,UM,CD); in clearing on high gravelly bank on east side of tamarack bog 5 mi. east of La Grange, La Grange Co., July 12, 1923, *Deam* 39,066 (CD); moist roadside 1 mi. west and 3 mi. south of Tefft, Jasper Co., July 20, 1930, *Deam* 49,180 (CD); low open place in H. H. Peele woods 1 mi. southwest of Knox, Starke Co., June 24, 1938, *Deam* 58,993 (MBG); open sandy low woods 3 mi. south and 1 mi. west of Knox, Starke Co., June 24, 1938, *Deam* 58,996 (MBG); sandy bank of freshly dug ditch 5 mi. north of Medaryville, Pulaski Co., Sept. 5, 1931, *Potsger* 2069 (IU).

KENTUCKY: Pine Mtn., Harlan Co., Aug. 1893, *Kearney* 76 (GH,NYB,UM).

TENNESSEE: dry woods, Cades Cove Mtn., July 29, 1897, *Ruth* 306 (GH).

MINNESOTA: Madison, July 1886, *ex Herb. L. Braun* (LB).

**34. *B. tinctoria* (L.) Vent. var. *projecta* Fern. in *Rhodora* 39: 415. 1937.**

As var. *crebra* Fern. except: leaves oblanceolate; racemes 3-4.5 dm. long.

Distribution: mountains, Pennsylvania to Virginia.

CITATION OF SPECIMENS:

PENNSYLVANIA: laurel woods, hill top, Warrior's Mark, Huntingdon Co., June 27, 1924, *Wiegand* (GH).

VIRGINIA: common in opening southwest of Skyland, Shenandoah Nat. Park, May 31, 1936, *Camp* 1281 (NYB); abundant, open slopes, rocky spurs and coves between Pass Mtn. and Oventop Mtn., Shenandoah Nat. Park, June 3, 1936, *Camp* 1340 (NYB); dry woods, Hot Springs, Bath Co., July 1, 1917, *Hunnewell* 4694 (GH,TYPE).

**35.  $\times$  *B. Deamii* Larisey, *hyb. nov.*<sup>35</sup>**

= *B. tinctoria* var. *crebra*  $\times$  *leucantha*.

Plant at least 1 m. high, usually glabrous throughout, occasionally sparsely pubescent in parts, blackening in drying; stem somewhat stout, relatively firm, ribbed, glaucous, erect or geniculate, widely but simply branched, branches ascending; upper leaves subsessile to short-petiolate, petioles of the lower leaves 5-8 mm. long; leaflets broadly obovate, rarely oblanceolate, cuneate, apex rounded, obtuse, finely apiculate or slightly retuse, 2.8-4.5 cm. long, 0.8-2.5 cm. broad, delicate, lightly reticulate, lower surface frequently pubescent toward the base, especially along the midvein; stipules lanceolate-setaceous,

<sup>35</sup>Inter *tinctoriam* var. *crebram* et *leucantham* media; herba usque ad 1 m. alta; foliolae late obovatae raro oblanceolatae cuneatae apice rotundae vel obtusae anguste apiculatae vel paulo retusae; corolla fulva, vexillo purpureo-maculato.



less than 5 mm. long, usually caducous; terminal racemes about 3 dm. long, lateral 1–2 dm. long, both loose, erect or somewhat flexuous; floral bracts ovate-lanceolate, 5–6 mm. long, usually caducous; pedicels slender, 4–7 mm. long; calyx-tube 6–7 mm. deep, upper lip entire, truncate, or slightly emarginate, lobes of the lower lip deltoid-ovate, 1–1.5 mm. long; corolla yellow, standard spotted with purple, 1.5–1.7 cm. high, 1–1.2 cm. broad, wings and keel 1.7–1.9 mm. long; mature pod oblongoid to subcylindrical, 1.7–2 cm. long, 0.7–0.9 cm. broad, very firm, rugose, black, pruinose, long-stipitate, short-beaked.

This hybrid is named in honor of Mr. Charles C. Deam in appreciation of his efforts to obtain material of the three entities involved; through his interest in the problem much information not otherwise available has aided in the study of this complex.

Distribution: sandy oak woods, northwestern Indiana.

CITATION OF SPECIMENS:

INDIANA: rare in black sandy soil along roadside through pin- and black-oak land about 3 mi. northwest of Knox, Starke Co., June 9, 1923, *Deam 58,811* (ANSP); in an open, sandy, low wood at southeast corner of crossroads 3 mi. north and 1 mi. west of Knox, Starke Co., June 24, 1938, *Deam 58,994, 58,995*, (MBG,TYPE); open woods at crossroads 3 mi. north, 1 mi. west of Knox, Starke Co., June 24, 1938, *Deam* (MBG); H. H. Peele woods 1 mi. southwest of Knox, Starke Co., June 24, 1938, *Deam* (MBG); open pasture, Knox, Starke Co., Sept. 8, 1935, *Deam & Fassett 17411* (UW).

36. × *B. pinetorum* Larisey, *hyb. nov.*<sup>36</sup>

= *B. tinctoria* var. *crebra* × *alba*.

Plant 1 m. or less, sparsely appressed-pubescent to glabrate throughout, darkening slightly in drying; stem slender, delicate, ribbed, usually glabrous, occasionally finely pubescent, ciliate at the nodes, somewhat glaucous; branches arising alternately from the primary stem, ascending; leaves slender-petiolate, petioles 4–7 mm. long, usually more densely pubescent than other parts; leaflets obovate to oblanceolate, cuneate, apex rounded to obtuse, occasionally finely apiculate, rarely retuse, 2–3 cm. long, 0.8–1.3 cm. broad, delicate, finely reticulate.

<sup>36</sup>Inter *tinctoriam* var. *crebram* et *albam* media; herba 1 m. alta vel minor; foliolae obovatae vel oblanceolatae cuneatae apice rotundatae vel obtusae interdum anguste apiculatae raro retusae; corolla gilva vel flava.

late, sparsely pubescent on lower surface or occasionally ciliate only on the mid-vein; stipules lanceolate-setaceous, less than 5 mm. long, usually persistent; terminal raceme 3-4 dm. long, lateral 1-2 dm. long, both loose, erect, only rarely flexuous; floral bracts lanceolate, 3-4 mm. long, usually caducous; pedicels slender, 5-7 mm. long; calyx-tube 4-5 mm. deep, upper lip usually entire, ovate, occasionally slightly emarginate, lobes of the lower lip deltoid-lanceolate, 2-2.5 mm. long; corolla deep cream to yellow, standard auriculate or entire, 1.1-1.3 cm. high, 0.9-1 cm. broad, wings and keel 1.2-1.5 cm. long; mature pod ovoid to oblongoid, occasionally subcylindrical, inflated, 1.3-1.7 cm. long, 0.5-0.7 cm. wide, thin but firm, strongly reticulate, purplish-brown, glaucous, tapering gradually into a long stipe and short, slender beak, beak recurved.

Distribution: pinelands, eastern Virginia.

CITATION OF SPECIMENS:

VIRGINIA: in open stand of *Pinus Taeda* 3½ mi. north of Accomac, Accomac Co., June 29, 1928, Jones (MBG,TYPE); in dry sandy field north of Accomac, Accomac Co., May 19, 1930, Moldenke 1254 (MBG,USN,NYB,UP); in woods on east side of Route 13, under *Pinus Taeda*, 4 mi. north of Accomac, Accomac Co., June 4, 1935 Tatnall 2656 (GH); sandy soil in dry open woods, mostly pine, 4 mi. north of Accomac, Accomac Co., June 29, 1928, True (UP).

**37. B. Serenae** M. A. Curtis in Am. Jour. Sci. II, 2: 406. 1849; Chapman, Fl. South. U. S., ed. 1, 112. 1860, ed. 2, 112. 1889, and ed. 3, 122. 1897; Small, Fl. Southeast. U. S., ed. 1, 600. 1903, and ed. 2, 600. 1913; Small, Man. Southeast. Fl. 677. 1933.

Plant 1 m. or less high, virtually glabrous, occasionally sparsely pubescent in parts, darkening but not usually blackening in drying; stem slender, firm, glabrous, simply but diffusely branched, secondary branches geniculate, subdichotomous, divaricate; leaves petiolate, petioles slender, 3-5 mm. long; leaflets usually oblanceolate, cuneate, occasionally elliptic, acute to rounded at the apex, finely mucronate, rarely retuse, 1.5-3 cm. long, 0.5-1 cm. broad, usually glabrous, lower surface occasionally finely pubescent along the midvein, margins revolute; stipules minute, setaceous, deciduous; terminal racemes 1-3 dm. long, lateral ones less than 1 dm. long, flowers subverticillate, ascending; floral bracts lanceolate-setaceous,

less than 3 mm. long, caducous; pedicels slender, 3–5 mm. long; calyx-tube 4–5 mm. deep, upper lip entire, ovate or truncate, rarely slightly retuse, lobes of the lower lip deltoid, 1–1.5 mm. long; corolla bright yellow, standard 1–1.2 cm. high, 1–1.2 cm. broad, wings and keel 1.2–1.4 cm. long; mature pod oblongoid, subcylindric, inflated, 1.5–3.5 cm. long, 0.6–0.8 cm. wide, thin but firm, rugose to strongly reticulate, ferruginous to purplish-brown, short-stipitate, short- and slender-beaked, ascending.

Distribution: pine barrens, South Carolina to Florida.

CITATION OF SPECIMENS:

SOUTH CAROLINA: Society Hill, July 3, 1878, *ex Herb. Canby* (MBG,USN,GH, NYB,FM); no definite locality, *Curtis 1848* (MBG,ISO-TYPE); Society Hill, *Curtis* (NYB); "in loc. humidis, vel prope," *Curtis* (GH); Aiken, June 1853, *Ravenel* (GH); pine barren, Summerville, June 10, 1891, *Taylor* (FM).

GEORGIA: mtns., Aug. 1841, *Buckley* (USN); between Tallulah Falls and Toocoa Falls, Habersham Co., Aug. 8, 1893, *Small* (USN,NYB,FM); Ocmulgee River Swamp, below Macon, May 18–24, 1895, *Small* (FM).

FLORIDA: dry open pine barrens, June 21, 1881, *Mohr* (USN,FM); dry grassy hills near Marianna, June 24, 1881, *Mohr* (GH).

**38. *B. macilenta*** Small *ex Larisey*, sp. nov.<sup>37</sup>

Plant less than 1 m. high, sparsely appressed-pubescent in parts, darkening throughout in drying but apparently not blackening; stem somewhat stout, firm, ribbed, glabrous, simply branched, branches ascending-spreading; leaves subsessile to short-petiolate, petioles slightly pubescent, less than 3 mm. long; leaflets spatulate to elliptic-spatulate, slightly cuneate, apex broadly acute, usually apiculate, 3–6 cm. long, 1–1.5 cm.

"Herba vix 1 m. alta, ex partibus sparse appresso-pubescentibus post exsiccationem fusca sed haud nigrescens ut videtur. Caules crassiusculi firmi striati glabri simpliciter ramosi, ramulis patulis ascendentibus. Folia subsessilia vel brevissime petiolata, petiolis paulo pubescentibus vix 3 mm. longis, foliolis spatulatis vel spatulato-ellipticis paulo cuneatis apice late acutis plerumque apiculatis 3–6 cm. longis 1.0–1.5 cm. latis delicate membranaceis leviter reticulatis nervo medio sparse ciliatis supra saturate viridibus subtus paulo glaucis, stipulis setaceis vix 3 mm. longis saepe caducis. Racemi vix bene cogniti sed ut videtur axillares erecti compacti folia vix superantes, bracteis incognitis caducis, pedicellis 4–5 mm. longis, calycis tubo 6–7 mm. alto extus glabrato intus dense pubescente, labii inferioris lacinis deltoideis 2.0–2.5 mm. longis, labro superiore distincte emarginato. Corolla flava, vexillo 1.5 cm. alto 1.1–1.3 cm. lato, alis carinae 1.6–1.9 cm. longis. Ovarium dense pubescens. Legumen maturum ovoideum vel subglobosum 1.0–1.2 cm. longum 0.8–1.0 cm. latum nigrum firmum vel fragile rugosum sparse pubescens longe stipitatum, stipite calycem bis superante longe angustaque rostrato.

broad, delicate, dark green above, somewhat glaucous below, finely reticulate, sparingly ciliate along the midvein; stipules setaceous, less than 3 mm. long, usually caducous; racemes imperfectly known, but apparently axillary, erect, compact, barely exceeding the foliage; floral bracts unknown, caducous; pedicels 4–5 mm. long; calyx-tube glabrate without, densely pubescent within, 6–7 mm. deep, upper lip distinctly emarginate, lobes of the lower lip deltoid, 2–2.5 mm. long; corolla dull yellow, standard 1.5 cm. high, 1.1–1.3 cm. broad, wings and keel 1.6–1.9 cm. long; ovary densely pubescent, mature pod ovoid to subglobose, 1–1.2 cm. long, 0.8–1 cm. broad, black, firm- but thin-walled, rugose, sparingly pubescent, long stipitate, stipe twice the length of the calyx, long- and slender-beaked.

It is a pleasure to publish this species in the name of the late Dr. John Kunkel Small whose work on the genus *Baptisia* has been the most comprehensive during the present century. Dr. Small had selected the type specimen and had drawn up a description under the name of *B. macilenta* to be published in his forthcoming work on the flora of the Southwest.

Distribution: prairies, western Louisiana.

CITATION OF SPECIMENS:

LOUISIANA: Chataignier, W. La., June 21, 1885, *Langlois* (NYB, TYPE).

**39. *B. riparia* Larisey, sp. nov.<sup>38</sup>**

Plant about 1 m. (?) high, sparingly pubescent in parts, blackening, somewhat glaucous throughout; stem stout, ribbed, glabrous, secondary branches arising alternately from a single

<sup>38</sup> Herba circiter 1 m. alta plus minusve pubescens omnino paulo glauca postremo nigrescens. Caules crassiusculi striati glabri, ramis alternatis, ramulis secundariis ultimisque subdichotomis geniculatis ascendentibusque. Folia glabra marginibus juventate exceptis, petiolis 4–7 mm. longis, foliolis plerumque obovatis saepe oblanceolatis cuneatis apice obtusis vel late acutis raro paulo retusis vel apiculatis 5.5–7.0 cm. longis 1.5–2.5 cm. latis membranaceis utrinque leviter reticulatis, stipulis deltoideis lanceolatis vel setaceis saepe vix 2 mm. excedentibus caducis vel persistentibus marginibus pubescentibus. Racemi terminales erecti paulo flexuosi 1.0–1.5 dm. longi folia haud excedenti, bracteis lanceolatis 3–4 mm. longis caducis. Flores subverticillati pallide lutei, pedicello 4 mm. longo, calyce nigro glabro 8–9 mm. longo, labro superiore integro truncato vel paululo emarginato, labro inferiore 2.5–3.0 mm. longo, lobis deltoideis. Corollae vexillo 1.5–1.7 cm. alto 1.5–1.6 cm. lato, alis carinaque 2.0–2.3 cm. longis, ovario dense luteo-sericeo. Legumen maturum ignotum.

primary stem, tertiary and subsequent branches subdichotomous, geniculate, ascending; leaves glabrous except along margins in bud, petioles 4–7 mm. long, leaflets firm but fairly delicate, lightly reticulate on both surfaces, mostly obovate, occasionally oblanceolate, cuneate, apex obtuse or broadly acute, only rarely slightly retuse or apiculate, 5.5–7 cm. long, 1.5–2.5 cm. broad; stipules pubescent along margins, deltoid, lanceolate or setaceous, not usually exceeding 2 mm. long, caducous or persistent; racemes terminal, erect, somewhat flexuous, 1–1.5 dm. long, not exceeding the foliage, flowers subverticillate; floral bracts lanceolate, 3–4 mm. long, caducous; pedicels 4 mm. long; calyx black, glabrous, 8–9 mm. deep, upper lip entire, truncate or slightly notched, lobes of the lower lip deltoid, 2.5–3 mm. long; corolla pale yellow, standard 1.5–1.7 cm. high, 1.5–1.6 cm. wide, wings and keel 2–2.3 cm. long; ovary thickly pubescent with silky yellow hairs, mature pod not known.

Distribution: along river banks in northwestern Florida.

CITATION OF SPECIMENS:

FLORIDA: banks of Ochlockonee River, 10 mi. west of Tallahassee, April 20, 1933, *Totten* (UNC,TYPE).

**40. *B. riparia* Larisey var. *minima* Larisey, var. nov.<sup>30</sup>**

As the species except: plant 3.5–5 (?) dm. high, stem slender, sparingly pubescent in younger parts, crown of white hairs at nodes; petioles pubescent, 5–8 mm. long, leaflets pubescent along midvein of lower surface, oblanceolate-elliptic, 3.5–5 cm. long, 1–1.5 cm. broad; stipules lanceolate, 0.5–1 cm. long, persistent; racemes 1 dm. long; upper calyx-lobe entire, rounded or truncate, lower lobes ovate-deltoid; ovary pubescent with white silky hairs.

Distribution: along river banks in northwestern Florida.

CITATION OF SPECIMENS:

FLORIDA: woods near Ochlockonee River, Havana, Gadsden Co., April 15, 1934, *Griscom 21581* (GH,TYPE).

<sup>30</sup> Ab specie differt: plantis verisimiliter 3.5–5 dm. altis, ramis gracilibus juvenate paulo pubescentibus, nodis barbularis; petiolis pubescentibus 5–8 mm. longis, foliolis oblanceolato-ellipticis 3.5–5.0 cm. longis, 1.0–1.5 cm. latis nervo medio subtus pubescentibus, stipulis lanceolatis persistentibus 0.5–1 cm. longis; racemis 1 dm. longis; calycis labro superiore integro rotundato vel truncato labro inferiore ovato-deltoideo; ovario villosa.

41. *B. megacarpa* Chapman ex Torr. & Gray, Fl. N. Am. 1: 386. 1840; Chapman, Fl. South. U. S., ed. 1, 111. 1860, ed. 2, 111. 1889, and ed. 3, 121. 1897; Small, Fl. Southeast. U. S., ed. 1, 600. 1903, and ed. 2, 600. 1913; Small, Man. Southeast. Fl. 677. 1933.

Plant 1 m. or less high, not blackening in drying; stem somewhat stout, firm, lightly ribbed, sparsely pubescent in young parts, glabrate, glaucous, with slender, widely spreading branches; leaves on slender petioles, 1.2–2 cm. long; leaflets broadly elliptic, pale yellow-green, delicate, primary and secondary veins prominent, the latter more or less parallel, pubescent to glabrate and somewhat glaucous beneath, 4–5 cm. long, 1.5 cm. broad; stipules lanceolate, 0.5–1 cm. long, persistent or caducous; terminal raceme up to 1.5 dm. long, lateral racemes usually less than 1 dm. long, all borne opposite the branches, not exceeding the foliage; pedicels slender, 1.2–1.5 cm. long; calyx-tube 8–9 mm. deep, upper lip ovate, cleft about 1 mm., lobes of the lower lip deltoid or deltoid-ovate, 2–3 mm. long, sinuses frequently quite wide; corolla pale yellow, standard 1.7 cm. high, 1.5 cm. broad, wings and keel 2.2 cm. long; ovary glabrous, mature pod yellowish tan, parchment-like, fragile, strongly reticulate, ellipsoid to ovoid, greatly inflated, 3.5–5 cm. long, 2–2.5 cm. wide, slender-stipitate, stipe not exceeding the calyx, short-beaked.

Distribution: rich soil, central Florida.

CITATION OF SPECIMENS:

FLORIDA: no definite locality, *Chapman* (GH, NYB); no definite locality, "*Chapman mis. 1846*" (MBG, TYPE); *Aspalaga*, Mar. 1897, ex *Herb. Chapman* (MBG); *Aspalaga*, May 1898, ex *Herb. Chapman* (MBG); *Gadsden Co., Chapman* (MBG); "*Talogie*" Creek, *Gadsden Co.*, 1836, *Chapman* (USN); "*in calcareis prope Cupaloga*, Mai 1843," *Rugel* (NYB); no definite locality, ex *Herb. J. Torrey* (GH).

42. *B. sphaerocarpa* Nutt. in Jour. Acad. Nat. Sci. Phila. 7: 97. 1834; Torr. & Gray, Fl. N. Am. 1: 384. 1840; Canby in Bot. Gaz. 4: 131. 1879; Small, Fl. Southeast. U. S., ed. 1, 599. 1903, and ed. 2, 599. 1913.

Plant 1 m. or less high, more or less tawny- (rarely whitish-) pubescent throughout, frequently glabrate in age; stem solitary, stout, relatively firm but occasionally delicate, heavily



ribbed, yellow through deep ferruginous or brownish-black, simply branched, branches straight, ascending, frequently somewhat twisted; leaves deep yellow-green, darkening into olive or brownish black upon drying, compound, subsessile to short-petiolate, petioles 1-3 mm. long, stout, channelled; young leaflets pubescent, mature glabrate, delicate, mid-vein prominent but otherwise not reticulate, broadly oblanceolate to obovate, occasionally elliptic, obtuse to obtusely acuminate, rarely retuse, never mucronate, 4.5-8 cm. long, 1.5-3.5 cm. broad; stipules narrowly lanceolate, 5 mm. long, to minute, setaceous, usually caducous, occasionally persistent; racemes terminal, 2-3 dm. long, slightly flexuous, axis twisted; flowers numerous, usually subverticillate, pedicels stout, 2-5 (rarely 8) mm. long; floral bracts lanceolate, 4-6 mm. long, caducous; calyx-tube reddish-brown or black, 0.8-1 cm. deep, upper lip cleft about 1 mm. but not usually separating, lobes of the lower lip lanceolate, 4-5 mm. long; corolla pale through deep yellow, standard slightly emarginate, 1.5-1.8 cm. high, 1.2-1.6 cm. broad, wings and keel 1.8-2.2 cm. long; pod ligneous, pericarp 2-3 mm. thick, glabrous, smooth or slightly rugose, ferruginous to brownish black, globose, usually as broad as long, 1.5-1.8 cm. long, 1.5-1.8 cm. broad, long-stipitate, stipe 5-8 mm. long, abruptly short-beaked.

Hybridizes with *B. leucantha* in Oklahoma, and *B. leuco-phaea* in Arkansas and Oklahoma.

Distribution: along stream banks and in moist ravines, or occasionally in open prairies of Arkansas and Oklahoma.

CITATION OF SPECIMENS:

ARKANSAS: Fort Smith, *Bigelow 1853-4* (USN,NYB); near Conway, Faulkner Co., spring 1936, *Diemer 1435* (MBG); vicinity of Little Rock, May 1837, *Engelmann* (MBG); Little Rock, *Gray* (GH); ravines, Little Rock, May 2, 1885, *Hasse A 510* (ANSP); creek bottom, June 1885, Little Rock, *Hasse 247* (MBG); Little Rock, May and July 1885, *Hasse* (NYB); near Little Rock, May 28, 1886, *Hasse* (MBG); vicinity of Fort Tawson, June and July, *Leavenworth* (NYB); Little Rock, May 18, 1884, *Letterman* (MBG,NYB,ANSP); along stream, highway 67/70, outskirts of Little Rock, Pulaski Co., April 27, 1935, *Lodewyks 163* (MBG); prairie, *Nuttall* (ANSP,TYPE, NYB); moist open ground near Hot Springs, Garland Co., May 15, 1924, *Palmer 24956* (MBG); along banks of small stream near Mansfield, Sebastian Co., May 24, 1931, *Palmer 39302* (MBG,NYB, GH).

OKLAHOMA: prairies, without definite locality, April 29, 1905, *Bebb 21004* (WU); Limestone Gap, May 10, 1887, *Butler* (MBG,USN); low hills, Ouachita Nat. For., Talihina, Le Flore Co., May 17, 1936, *Demaree 12700* (NYB); near Fanshawe, Le Flore Co., May 5, 1935, *Goodman 2552* (MBG); dry field west of Sulphur, Murray Co., May 1, 1926, *Stratton* (MBG).

**43. *B. viridis* Larisey, sp. nov.<sup>40</sup>**

Plant 1 m. or less high, more or less appressed-pubescent when young, frequently glabrate in parts at maturity; stem occasionally solitary, usually several, slender, firm, lightly ribbed, straw-colored to reddish-tan, widely branched, lower branches dichotomous, terminal and lateral ones strongly geniculate, usually ascending; leaves pale yellow-green, retaining color in drying, pubescent above and below; lowermost trifoliate, petiolate, petioles 0.3–1 cm. long, leaflets oblanceolate to obovate with slightly cuneate base, or elliptic, obtuse, retuse or slightly mucronate at apex, 2.5–5 cm. long, 1–2.5 cm. broad, lateral leaflets usually ascending, somewhat smaller than the terminal leaflet; leaves of terminal and lateral geniculate branches bifoliate or unifoliate, petiolate, petioles 2–5 mm. long, leaflets frequently unequal in size, broadly elliptic, 2.5–5 cm. long, 1–3 cm. broad, as long or twice as long as the

<sup>40</sup>Herba 1 m. vel minor alta juventate plus minusve appresse-pubescentia maturitate saepe glabrata. Caules plerumque plures aliquando solitarii graciliusculi firmi paulo striati straminei vel fulvi late ramosi inferne dichotomi superne valde geniculati plerumque ascendentes. Folia diuturne dilute stramineo-viridia utrinque pubescentia, inferiora 3-foliolata petiolata, foliis obovatis vel oblanceolatis vel ellipticis apice retusis vel paulo mucronulatis basi paululo cuneatis 2.5–5.0 cm. longis 1.0–2.5 cm. latis, lateralibus quam foliolo medio paululo minoribus saepissime ascendentibus, petiolo 3–10 mm. longo, superiora saepe 2-foliolata petiolata, petiolis 2–5 mm. longis saepissime 1-foliolata subsessilia vel brevissime petiolata late elliptica 2.5–5 cm. longa 1–3 cm. lata internodia aequantia vel 2-plo superantia; stipulis subulatis minutis saepissime caducis vel haud manifestis; racemi numerosi compacti erecti paulo flexuosi contorti, terminali 2–3 dm. longi, laterali saepe 1.5–2.5 dm. longi. Flores numerosi sat regulariter positi vel haud raro subverticillati, pedicellis crassiusculis 3–5 (raro 10) mm. longis, bracteis lanceolatis vel subaetaceis 3–5 mm. longis caducis; calycis tubo 4–7 mm. longo, labro superiore ovato paululo fisso sed vix lobato, labri inferiori lobis deltoideis vel lanceolatis acuminatis tubum ca. dimido aequantibus. Corolla saturate flava, vexillo orbiculari-reniforme 1.0–1.5 cm. longo 1 cm. lato reflexo, alis carinae 1.5–2.0 cm. longis. Legumen subglobosum vel late oblongoideum 1.2–2.0 cm. longum, 1.4–1.6 cm. latum abrupte sed longe (10–13 mm.) rostratum glabrum lignosum fulvum, stipite 5–6 mm. longo calyceem circumscissilem vix superante.

internodes, ascending; stipules subulate, minute, usually caducous, or lacking altogether; racemes numerous, compact, erect, slightly flexuous, axis twisted, the terminal 2-3 dm. long, the lateral usually only 1.5-2.5 dm. in length; flowers numerous, evenly spaced or occasionally subverticillate, pedicels stout, 3-5 (rarely 10) mm. long; floral bracts lanceolate to setaceous, 3-5 mm. in length, caducous; calyx-tube 4-7 mm. deep, upper lip ovate, slightly cleft but lobes rarely separating, lobes of lower lip deltoid to lanceolate, acuminate, at least one-half the length of the tube; corolla deep yellow, standard orbicular, reniform, 1 cm. broad, 1-1.5 cm. high, reflexed, wings and keel 1.5-2 cm. long; pod ligneous, pericarp 1-2 mm. thick, glabrous, reddish-tan, subglobose, frequently broader than long, 1.2-2 cm. long, 1.4-1.6 cm. broad, stipe 5-6 mm. long, barely exceeding the calyx which becomes circumscissile at the base, abruptly but long-beaked, beak 1-1.3 cm. long.

Hybridizes with *B. leucantha* in Louisiana and Texas, and *B. leucophaea* var. *glabrescens* in Louisiana and Texas.

Distribution: Louisiana, Arkansas, Oklahoma and south to Texas; introduced along railroads in Missouri.

CITATION OF SPECIMENS:

LOUISIANA: prairie west of Crowley, Acadia Parish, July 16, 1935, *Brown 5809* (LU); prairie north of Crowley, Acadia Parish, April 26, 1936, *Brown 6273* (LU); prairie along RR. 4 mi. north of Rayne, Acadia Parish, April 27, 1936, *Brown 6293* (LU); prairies, Crowley, April 2, 1911, *Cocks 10* (NYB,TU); prairies, Crowley, April 15, 1920, *Cocks* (TU); coast prairies between Rayne and Crowley, Acadia Parish, July 4, 1934, *Harper 3235* (MBG,USN,GH,NYB); prairie about 1 mi. W. of Crowley, Acadia Parish, April 7, 1936, *Harper 3475* (MBG,USN,GH,ANSP); prairies, Opelousas, April 1880, *Langlois* (NYB,PM); prairies, Akapul, May 27, 1883, *Langlois 11* (NYB); plains around Abbeville, May 28, 1883, *Langlois* (FM).

MISSOURI: Frisco RR., Tyson Station, St. Louis Co., 1900, *Barnes* (MBG); Frisco RR. 100 yards east of Allenton, May 25, 1896, *Letterman* (MBG); Allenton May 1897, *Letterman* (MBG); near Allenton on Frisco track, May 12, 1912, *Letterman* (MBG); cleared lands along Frisco RR., near Wynne Junction, Barry Co., June 5, 1926, *Palmer 30463* (MBG); swales, cleared lands along RR. near Seligman, Berry Co., June 3, 1926, *Palmer 30474* (MBG); Springfield, June 1907, *Standley* (USN).

ARKANSAS: May 1837, collector unknown (WU).

OKLAHOMA: lowlands, prairie, Wichita Mtns., April 18, 1928, *Barkley* (UD); without definite locality, 1877, *Butler* (MBG); dry ridge pastures, Davis, Murray Co., April 4 and 24, 1936, *Demaree 12275* (UT,USN); prairie, Arbuckle Mtns.,

April 1908, *Gage* (UO); prairies, northwest of Hugo, May 12, 1930, *Sears 1332* (UO); prairies, common in sandy soil near Colbert's Station, June 17, 1891, *Sheldon 17* (UM,USN).

TEXAS: along RR. 2 mi. east of Pine Island, Jefferson Co., April 20, 1936, *Anderson & Hubricht* (MBG); Beaumont, April 15, 1930, *Benke 5370* (GH,FM); sandy soil, Houston, Harris Co., April 10, 1903, *Biltmore Herb. 14778* (UM); abundant on low flat coast prairie, Orange, April 17, 1899, *Bray* (USN,UT); Genoa, Harris Co., Mar. 19, 1938, *Chandler 2684-A* (MBG); Houston, Mar. 20, 1938, *Chandler 2684-B* (MBG); near Turning Basin, Harris Co., April 14, 1934, *Cory 8131* (GH); 14 mi. southwest of Orange, Cow Bayou, Orange Co., May 15, 1937, *Cory 22321 & 22322* (MBG); 2¼ mi. north of Paris, Lamar Co., May 21, 1937, *Cory 23114* (MBG); Rio Brazos, 1833, *Drummond* (GH); prairies north of Houston, Harris Co., April 20, 1899, *Eggert* (MBG); dry hills north of Longview, Gregg Co., June 7, 1899, *Eggert* (MBG); Rosenberg, April 13, 1900, *Eggert* (MBG); Houston, April 5, 1913, *Fisher 335* (USN); Houston, April 21, 1914, *Fisher* (WU); Houston, Mar. 22, 1938, *Fisher 3844* (FM); wet prairies, Houston, Mar. 20, 1872, *Hall 160* (MBG,TYPE, USN,GH,NYB,FM,COTYPES); no definite locality, *Lindheimer* (MBG); near Houston, April 1839, *Lindheimer* (MBG); Houston, Mar. 1842, *Lindheimer* (GH); Leonard, Collin Co., May 1, 1886, *Merrill* (NYB); Bonheur, April 16, 1896, *Milligan 9515* (WU); no definite locality, 1889, *Neally 69* (USN,NYB); no definite locality, May 1883, *Oyster 23809* (WU); Columbia, Brazoria Co., Mar. 29, 1914, *Palmer 5046* (MBG,USN,FM); prairies, Ganado, Jackson Co., Mar. 10, 1916, *Palmer 9228* (MBG,USN); prairies near Texarkana, Bowie Co., April 23, 1923, *Palmer 22436* (MBG,GH); along RR. at Eads Station, Smith Co., April 23, 1901, *Reverchon 2655* (MBG); Sabine, April 25, 1903, *Reverchon* (MBG); 10 mi. south of Angleton, Brazoria Co., June 19, 1937, *Reed 27556 (258)* (MBG); sandy prairie, Beaumont, April 23, 1903, *Reverchon 3738* (MBG); Dallas, June 26, 1903, *Reverchon* (MBG); prairies, Paris, April 10, 1904, *Reverchon 4294* (MBG,GH); near Houston, May 6, 1899, *Rose 4191* (USN,NYB,FM); Cleveland-Dayton, April 19, 1930, *Tharp* (UT); Chambers Co., April 7-10, 1936, *Tharp* (UT); El Campo, June 1923, *Tharp 2314* (UT); Lovelady, April 21, 1933, *Tharp* (UT); gravelly hill across Mo. Pac. RR. at 24th St., Austin, Mar. 31, 1933, *Tharp* (UT); Walker Co., 1920, *Warner 13* (USN); no definite locality, *Wright* (GH).

**44. × *B. fragilis* Larisey, hyb. nov.<sup>41</sup>**

= *B. viridis* × *leucantha*.

Plant about 1 m. high, minutely pubescent to glabrate throughout, blackening slightly in drying; stem slender, firm, or occasionally fairly stout, delicate, ribbed, reddish, somewhat glaucous, widely branched, branches ascending-spread-ing; leaves dark green, blackening slightly, usually compound, occasionally simple through fusion, irregularly lobed, peti-

<sup>41</sup>Inter *viridem* et *leucantham* media; herba usque ad 1 m. alta; folia plerumque composita interdum simplicia irregulariter lobata, foliolis oblanceolatis vel obovatis cuneatis apice rotundatis plerumque apiculatis raro retusis; corolla flava.

olate, petioles 3–6 mm. long, leaflets usually glabrate at maturity, delicate, midvein prominent, not otherwise reticulate, margins revolute, oblanceolate to obovate, cuneate, rounded at apex, frequently apiculate, rarely retuse, 2.5–3.5 cm. long, 1.5 cm. broad; stipules minute, lanceolate to setaceous, 1–3 mm. long, usually caducous, occasionally persistent; racemes 1–2 dm. long, slightly flexuous; flowers subverticillate; floral bracts lanceolate to setaceous, 4 mm. long, caducous; pedicels 4–6 mm. long, fairly stout; calyx-tube black, 8–9 mm. deep, 6–7 mm. wide, upper lip entire or minutely cleft, lobes not usually separating, lobes of the lower lip broadly acute separated by a wide sinus, 2–2.5 mm. long; corolla yellow, blackening, standard emarginate, 1.5–1.7 cm. high, 1.4–1.5 cm. broad, wings and keel 2 cm. long; ovary black, glabrous, oblong, stipe equalling the length of the calyx, style 11–12 mm. long; mature pod imperfectly known, but ligneous.

Distribution: eastern Louisiana and Texas.

CITATION OF SPECIMENS:

LOUISIANA: along RR. 2 mi. east of Pine Island, Jefferson Co., April 20, 1936, Anderson & Hubricht (MBG,TYPE).

TEXAS: Nome, April 7, 1938, Fisher 3832 (FM).

45. × *B. sulphurea* Engelm. in Bot. Gaz. 3: 65. 1878; Canby in Bot. Gaz. 4: 132. 1879; Small, Fl. Southeast. U. S. 599, ed. 1. 1903, and ed. 2, 599. 1913.

= *B. sphaerocarpa* × *leucantha*.

Plant at least 1 m. high, minutely pubescent or glabrate throughout, blackening in drying; stem solitary, fairly stout, delicate, ribbed, branches arising alternately from main stem, subdichotomous, spreading; leaves dark green, compound, petiolate, petioles 2–7 mm. long, young leaflets pubescent along margins and midvein, virtually glabrous at maturity, firm, midvein prominent on lower surface but otherwise not reticulate, broadly oblanceolate to obovate, slightly cuneate toward base, rounded, obtuse, slightly retuse, occasionally apiculate, 3.5–5 cm. long, 1.5–2.3 cm. broad, lateral leaflets converging, somewhat smaller than the primary leaflet; stipules lanceolate, 8–10 mm. long, persistent; racemes 1 dm. or less, flexuous, flowers subverticillate, floral bracts unknown, caducous; pedicels some-



what stout, 2-4 mm. long; calyx-tube black, 7-8 mm. deep, 6-7 mm. wide, upper lip entire, truncate, or slightly emarginate, lobes of the lower lip deltoid, 3 mm. deep; flowers dull yellow, standard 1.5-1.7 cm. high, 1.4-1.5 cm. broad, wings and keel 2-2.2 cm. long; ovary black, glabrous, glaucous, oblong-ovoid, stipe equalling the length of the calyx, beak 1-1.2 cm. long, slightly recurved; mature pod imperfectly known, but ligneous.

Distribution: prairies, Oklahoma.

CITATION OF SPECIMENS:

OKLAHOMA: rare, prairies, Tabaksi Co., "Indian Territory," fl. May, *Butler* (MBG,TYPE); prairies 10 mi. north of Limestone Gap, May 22, 1877, *Butler* (MBG, NYB,FM); Kiowa, between Arkansas and Red rivers, May 22, 1877, *Butler* (GH).

**46. *B. australis* (L.) R. Br.** in Ait. Hort. Kew., ed. 2, 3: 6. 1811; Ell. Sketch Bot. S. Car. & Ga. 1: 468. 1821; DC. Prodr. 2: 100. 1825; Maund, Bot. Gard. 6: 567. 1835-6; Torr. & Gray, Fl. N. Am. 1: 385. 1840; Ralph, Ic. Carpolog. 44, pl. 40. 1849; Chapman, Fl. South. U. S., ed. 1, 112. 1860, ed. 2, 112. 1889, and ed. 3, 121. 1897; Step, Fav. Fl. 1: 130, pl. 64. 1896; Britton & Brown, Illust. Fl. North. U. S. ed. 1, 2: 265, fig. 2049. 1897, in part, and ed. 2, 2: 344, fig. 2453. 1913, in part; Small, Fl. Southeast. U. S., ed. 1, 601. 1903, and ed. 2, 601. 1913; Sedgwick & Cameron, Gard. Month by Month, 144. 1907. *Illust.*; Gray, New Man. Bot., ed. 7, 506. 1908; Keeler, Gard. Fl. 241. 1910. *Illust.*; Mathews, Field Book Am. Wild Fl. 209. 1912. *Illust.*; Small, Man. Southeast. Fl. 678. 1933.

*B. exaltata* Sweet, Br. Fl. Gard. 1: pl. 97. 1825; Jour. Hort. III, 34: 511. 1897. *Illust.*

*B. versicolor* Lodd. Bot. Cab. 12: pl. 1144. 1826.

*B. confusa* Sweet ex G. Don, Gen. Syst. [Hort. Brit.], ed. 2, 123. 1830.

*B. caerulea* Michx. in Eaton & Wright, Man. N. Am. Bot., ed. 8, 154. 1840.

*Sophora caerulea* Trew, Pl. Rar. 6, pl. 14. 1779.

*Sophora australis* L. Syst. Veg., ed. 14, 391. 1784; Ait. Hort. Kew. 2: 45. 1789; Sims in Curt. Bot. Mag. I, 15: 509. 1801.

*Podalyria australis* Willd. in L. Sp. Pl., ed. 4, 2: 503. 1799; Vent. Desc. Fl. Nouv. Jard. Cels. 56, pl. 56. 1800.



*Ripasia cerulea* Raf. New Fl. N. Am. 2: 48. 1836 [1837].

Plant 1.5 m. high, glabrous throughout, more or less glaucous; stem stout, furrowed, erect, simply branched, branches usually ascending, lateral ones occasionally spreading or drooping; leaves petiolate, petioles semiamplexicaul, channeled, 0.5–1.2 cm. long, leaflets somewhat delicate, subsessile to shortly petiolate, obovate to obovate-lanceolate, cuneate, slightly attenuate to obtuse, rarely retuse at the apex, 4–8 cm. long, 1.5–3 cm. broad; stipules lanceolate or ovate-lanceolate, acuminate, 0.7–1.5 cm. long, usually persistent; racemes loose, terminal, erect, flexuous, 2–5 cm. long; flowers distantly scattered, solitary or subverticillate; bracts ovate-lanceolate, 1–1.2 cm. long, caducous; pedicels slender, 0.7–1.2 cm. long; calyx-tube 0.9–1 cm. deep, 5–7 mm. broad, upper lip barely cleft, lobes of the lower lip deltoid, acute, 2.5–3 mm. deep; corolla dull violet to deep blue, inner petals frequently lighter, standard deeply emarginate, sometimes auriculate, laterally reflexed, 2.2 cm. long, wings and keel 2.5 cm. long; mature pod grayish to brownish-black, oblong-elliptic, firm, slightly inflated, wrinkled, 3.5–4 cm. long, 1–1.5 cm. broad, mucronate, short-stipitate, stipe not exceeding the calyx.

Distribution: rocky soil, clay or sand along river banks, Vermont to North Carolina, west to southern Indiana and Tennessee.

CITATION OF SPECIMENS:

VERMONT: Westminster, Sept. 29, 1901, *Blanchard* (GH); Royalton, July 18, 1891, *Eggleston 2565* (GH, NYB, UM); established on bank of White River, Royalton, June 25, 1902, *Eggleston 2847* (GH, NYB); by White River, Royalton, June 12, 1900, *Wild* (GH).

PENNSYLVANIA: on sand bars along Allegheny River below Aspinwall, Allegheny Co., June 6, 1933, *Bright 8820* (UM); Brownsville, Fayette Co., Aug. 16, 1868, *Garber* (MBG, GH, ANSP); abundant, Clarion River, 1845, *Henderson* (ANSP); Allegheny Co., June 14, 1869, *Knife* (USN, NYB); sandy shores, Allegheny River 7 mi. above Pittsburgh, *Shafer 615* (GH); Allegheny River bank at mouth of Bear Creek, Allegheny Co., June 8, 1884, *Shafer* (UM).

MARYLAND: gravelly river bank, High Island, May 19, 1895, *Kearney* (OU); rocky flat, Chain Bridge, June 17, 1924, *Pennell 12082* (ANSP); rocky islands, Potomac, Montgomery Co., June 6, 1881, *Smith* (USN); Chain Bridge, Oct. 1897, *Tidestrom* (ND).

DISTRICT OF COLUMBIA: vicinity of Washington, Sept. 20, 1873, *Chickering* (ND); vicinity of Washington, May 30, 1874, *Chickering* (NYB); along Potomac

River near Glen Echo Junction, Aug. 30, 1905, *House 1484* (MBG); near Washington, 1884, *McCarthy 53* (UN); moist grounds, banks of the Potomac, Washington, May 22, 1877, *Morong* (MBG, NYB); Potomac Flats near Chain Bridge, Washington, July 14, 1895, *Pollard 501* (NYB); near Chain Bridge along Potomac River, above Washington, July 4, 1912, *Russell* (UM); rocky flats of Potomac, May 9, June 27, 1896, *Steele* (DU, UM); vicinity of Washington, May 25, Sept. 21, 1879, *Ward* (MBG); Little Falls of Potomac, May 30, 1909, *Williamson* (ANSP).

VIRGINIA: James River south of Natural Bridge Station, May 30, 1909, *Bartram* (NYB, GH); Harper's Ferry, June 1872, *Canby* (ANSP); Harper's Ferry, May 21, 1911, *Greene* (ND); bank of Shenandoah River, Page Co., May 23, 1900, *Müller* (USN); Carter's Ferry, Draper's Valley, Pulaski Co., June 4, 1871, *Shriver* (GH).

NORTH CAROLINA: Willardville, *Ashe* (NYB); waste grounds between Watts and Dollar Streets, Durham, Durham Co., May 8, 1938, *Blomquist 10253* (UNC); no definite locality, May 1884, *McCarthy* (WU).

OHIO: gravel beaches of Little Miami, Terrace Park, Sept. 20, 1910, *Braun* (LB); gravel beaches of Little Miami, Terrace Park, May 25, 1911, *Braun* (LB); Monroe Co., 1892, *Herser* (OU); Olive Twp., Meigs Co., May 30, 1936, *Jones* (NYB, OU); Pomeroy, Meigs Co., Aug. 26, 1895, *Kellerman* (OU); river bank near Cincinnati, June, *Lea 10-1* (ANSP); Steubenville, May 25, 1878, *Mertz* (NYB); Fernbank on banks of river near North Bend, *Short* (ANSP); Cincinnati, Hamilton Co., July 1879, *Spurlock* (OU); Leroy, Lake Co., *Tyler* (OU); near Painesville, June 5, 1888, *Werner* (UM).

WEST VIRGINIA: near mouth of Blue Stone River, Summers Co., July 16, 1930, *Berkley 1116* (MBG); near Wheeling, May 25, 1878, *Mertz* (GH); shores of Ohio River, Wheeling, May 31, July 28, 1879, *Mertz* (USN, ANSP); near mouth of Blue Stone River, Summers Co., July 16, 1929, *W. U. Bot. Exp.* (GH); vicinity of Thurmond, June 22, 1903, *Biltmore 136c* (UM).

INDIANA: along river bank 3 mi. east of Madison, May 25, 1936, *Banta 10877* (IU); river bank, Madison, May 5, 1878, *Barnes* (MBG, WU); Hanover, *Coulter* (MBG); hard clay, rocky soil, slope of bank of Ohio River 4 mi. east of Madison, Jefferson Co., Sept. 23, 1919, *Deam 30,167* (CD); rare on low rocky bank of the Ohio River at Chas. Dean's Landing, Jefferson Co., June 19, 1923, *Deam 38,901* (CD); frequent on stony ledges of slope of bank of the Ohio River about 2 mi. east of North, Switzerland Co., May 29, 1930, *Deam 48,558* (CD); rocky slope of the bank of the Ohio River 2 mi. north of Derby, Perry Co., *Deam 51,592* (CD); rare along the N. Y. Cent. tracks in Lake Co., near the Porter Co. line, June 9, 1935, *Hull* (CD); sandy shore, Ohio River, Marble Hill, Jefferson Co., June 19, 1923, *Pennell 11780* (ANSP); low wet ground along the Ohio River 3 mi. east of Madison, May 16, 1925, *Weatherwax 3205* (IU).

KENTUCKY: river bank, South Fork, Cumberland Rd., McCreary Co., June 18, 1935, *Braun* (LB); Ohio River bank near Warsaw, Gallatin Co., June 1, 1936, *Braun* (LB); no definite locality, *Chapman* (NYB); Shelbyville, *Flint* (GH); banks of the Ohio River, coll. of 1860, *Short* (MBG, ANSP); rocky banks 8 mi. northeast of Elizabethtown, Hardin Co., Sept. 6, 1927, *Wherry & Pennell 13659* (ANSP).

TENNESSEE: Orchard Knob near Chattanooga, May 4, 1902, *Canby 25* (GH); La Vergne, June 1885, *Gattinger* (USN); river bank, Clinch River near Kyles Ford, Hancock Co., July 27, 1935, *Underwood & Sharp 3050* (CD).

47. *B. minor* Lehm. Ind. Semin. Hort. Hamb. 16. 1827; in *Linnaea* 3: Litt. 119. 1828; in *Nov. Act. Nat. Cur. (Leop. Carol. Deutsch. Akad. Naturforsch. Nova Acta)* 14: 803. 1828 [1829]; Larisey in *Am. Jour. Bot.* 26: 538-39. 1939.

*B. australis* (L.) R. Br. var.  $\beta$ , Torr. & Gray, *Fl. N. Am.* 1: 385. 1840.

*B. texana* Buckl. in *Proc. Acad. Nat. Sci. Phila.* 13: 452. 1861; *Ibid.* 14: 163. 1862.

*B. vespertina* Small ex Rydb. *Fl. Prairies & Plains Central N. Am.* 456. 1932.

*B. australis* (L.) R. Br. var. *minor* Fernald in *Rhodora* 39: 312. 1937.

Plant 6-12 dm. high, glabrous throughout, more or less glaucous; stem slender, firm, lightly ribbed, geniculate, widely dichotomously branched; leaves subsessile to short-petiolate, petioles 2-4 mm. long, leaflets firm, reticulate, obovate to obovate-cuneate, occasionally elliptic, apiculate, rarely obtuse or retuse, 2-3.4 cm. long, 0.5-1 cm. broad; stipules lanceolate to setaceous, 3-9 mm. long, persistent or caducous; racemes terminal, erect, compact, not usually flexuous, 1-2.5 dm. (rarely 3.5 dm.) long; flowers usually evenly spaced, sometimes subverticillate but very closely arranged; floral bracts cordate to ovate-lanceolate, 7-9 mm. long, caducous; pedicels stout, 5-7 mm. long; calyx-tube 9-10 mm. deep, 6-8 mm. broad, upper lip subconnate, lobes of lower lip usually ovate, sometimes acute, 2-3 mm. long; corolla dull violet to deep blue, inner petals lighter, frequently tinged with yellow, standard emarginate, laterally reflexed, 2.5 cm. long, wings and keel 2.7-3 cm. long; mature pod oblong, brownish-black, ligneous but brittle, much inflated, not wrinkled, 3-6 cm. long, 1.5-2.5 cm. broad, tapering gradually into a short beak, long-stipitate, stipe twice as long as the calyx.

Hybridizes with *B. leucophaea* in Missouri, Kansas and Oklahoma.

Distribution: dry hills, limestone glades and prairies, Missouri and Kansas, southwest to Texas; introduced along railroads in Nebraska.

## CITATION OF SPECIMENS:

MISSOURI: center of long glade, Ledge Ridge, Mo. Bot. Gard. Arboretum, Gray Summit, Franklin Co., May 16, 1937, *Anderson* (MBG); St. Genevieve Co., May 7, 1939, *Anderson* (MBG); uncommon, introduced, Courtney, Jackson Co., May 13, 1896, *Bush 325* (MBG); common in barrens, Eagle Rock, June 2, 1897, *Bush 27* (MBG); common on prairie, Webb City, May 12, 1902, *Bush 1535* (MBG); prairies, Lake City, May 20, 1921, *Bush 9358-A* (MBG); rocky glades, Reed's Spring, April 30, 1936, *Bush 15346* (MBG); barrens, Baxter, May 27, 1936, *Bush 15565* (MBG); glades, Gray Summit, May 1, 1938, *Cutler* (MBG); Jefferson Co., June 23, 1891, *Eggert* (MBG); dry hills north of DeKalb, Jefferson Co., June 24, 1891, *Eggert* (MBG); dry hills north of Victoria, Jefferson Co., July 7, 1891, *Eggert* (MBG); Hematite, Jefferson Co., July 7, 1891, *Eggert* (MBG, NYB); rocky open places, Jefferson Co., May 22, 1892 (June 23, 1891), *Eggert* (GH); dry hills, St. Francois Co., June 10 (July 3), 1892, *Eggert* (GH); Victoria, Jefferson Co., May 21, 1893, *Eggert* (MBG, NYB); Victoria, May 11, 1896, *Eggert* (MBG, NYB); dry rocky hills north of De Soto, June 27, 1898, *Eggert* (MBG); glades, De Soto, Jefferson Co., *Ham* (NYB); Jefferson Co., May 28, 1887, *Hasse* (MBG); Victoria, Jefferson Co., July 8, 1890, *Hitchcock* (MBG); Dittmer, Jefferson Co., June 10, 1928, *Kellogg 1797* (MBG); Allenton, May 10, June 20, 1896, *Letterman* (MBG, NYB); Allenton, May 5, 1897, *Letterman* (MBG); near Crescent, Aug. 3, 1911, *Letterman* (NYB); uncommon, introduced along RR., Sheffield, Jackson Co., May 23, 1896, *Mackenzie 344* (MBG); rare, Santa Fe RR. near Rock Creek, May 23, 1896, *Mackenzie* (NYB); open limestone slopes of "Bald Joe," Stone Co., April 30, 1924, *Palmer 24622* (MBG); rocky slopes, bald knobs, along Mo.-Ark. state line near Eagle Rock, Barry Co., April 30, 1926, *Palmer 29851* (MBG); limestone glades 4 mi. north of Bloomsdale, St. Genevieve Co., June 12, 1930, *Steyermark 1482* (MBG); limestone glade in upland woods near Pomme de Terre River, 1½ mi. west of Doran Spring, 4 mi. south of Hermitage, Hickory Co., July 12, 1934, *Steyermark 13380* (MBG); natural prairie between Caplinger Mills and Stockton, about 3 mi. north of Stockton, Cedar Co., July 13, 1934, *Steyermark 13422* (MBG); rocky upland prairie glade 5 mi. north of Warsaw, Benton Co., May 24, 1936, *Steyermark 10700a* (MBG); upper lime barrens on top of bluff along Pomme de Terre River around Buzzard's Roost, 2 mi. northeast of Rondo, Polk Co., Aug. 1, 1937, *Steyermark 24100* (MBG); glades of Jefferson Co., May 24, 1885, *Wislizenus 96* (MBG).

ARKANSAS: open places, Carroll Co., May 9, 1936, *Bush 15375* (MBG); Beaver, April 21, 1929, *Davis* (WU); Eureka Springs, April 30, 1909, *Kellogg* (MBG); no definite locality, *Nuttall* (ANSP); common, dolomite hills, Carroll Co., April 20, 1929, *Palm 6507* (USN); open rocky hillsides, Eureka Springs, Carroll Co., May 10, 20, 1914, *Palmer 5523* (MBG); in grassy situations, *Pitcher* (ANSP); Eureka Springs, April 19, 1899, *Trelease* (MBG).

NEBRASKA: probably Jefferson Co., *Knight* (UN); apparently very rare, RR. south of Pioneer Park near Lincoln, Lancaster Co., May 15, 1934, *Sperry* (UN).

KANSAS: Geuda, Sumner Co., May 5, 1886, *Bassler* (UM); Kanopolis, Ellsworth Co., summer of 1898, *Becker* (KA); prairies, Lindsay, May 1887, *Bodin* (UM); hillside not far from Lake City, Barber Co., May 2, 1936, *Bondy 396* (MBG); on high prairie, Greenwood Co., May 8, 1879, *Broadhead* (MBG); Strong City, Chase Co., May 7, 1888, *Carleton* (KA); Washington Co., July 24, 1897, *Clothier & Whitford* (KA); Labette Co., Aug. 18, 1897, *Clothier & Whitford* (KA); Elk Co., Aug. 20 & 21, 1897, *Clothier & Whitford* (KA); Cowley Co., Aug. 22, 1897, *Clothier &*

*Whitford* (KA); Sedgwick Co., Aug. 24, 1897, *Clothier & Whitford* (KA); Woodson Co., Aug. 29, 1897, *Clothier & Whitford* (KA); prairies, Edwards Co., May 1932, *Finch 23* (MBG); Cloud Co., 1930, *Fraser 328* (KA); herb in the sand dunes of Medora, Reno Co., May 14, 1932, *Gates 17098* (KA); herb in the prairie at northwest corner of Wingfield Twp., Oct. 3, 1935, *Gates 18643* (MBG); Ft. Riley, May 16, 1892, *Gayle 461* (NYB); Wilson Co., May 5, 1896, *Haller* (KA); widely distributed southeast of Salina, Saline Co., April 24, 1930, *Hancin 178* (KA); Manhattan, May 10, 1883, *Higginbotham* (KA); Fairchild, *Hitchcock* (KA); White Water, Butler Co., July 1892, *Hitchcock* (KA); Concordia, Cloud Co., June 17, 1897, *Hitchcock* (KA); Clay Co., July 1895, *Hitchcock* (KA); Lincoln Co., July 1895, *Hitchcock* (KA); Ottawa Co., July 1895, *Hitchcock* (KA); Barton Co., Aug. 1895, *Hitchcock* (KA); Morris Co., Aug. 1895, *Hitchcock* (KA); Rice Co., Aug. 1895, *Hitchcock* (KA); Franklin Co., July 1896, *Hitchcock* (KA); Anderson Co., July 1896, *Hitchcock* (KA); Pratt Co., Aug. 1896, *Hitchcock* (KA); Harper Co., Aug. 1896, *Hitchcock* (KA); Edwards Co., Sept. 1, 1897, *Hitchcock* (KA); Stafford Co., Sept. 1, 1897, *Hitchcock* (KA); Manhattan, April 26, 1891, *Jackson* (NYB); prairie southeast of Monmouth, Cherokee Co., May 2, 1930, *Jacobs 18* (KA); Manhattan, May 17, 1887, *Kellerman* (KA); Manhattan, Riley Co., May 28, 1889, *Kellerman* (MBG); Shawnee Co., Aug. 20, 1896, *Lockhart* (KA); dry prairie west of Wabaunsee, Wabaunsee Co., May 9, 1927, *Maus 13* (KA); near Altamont, Labette Co., May 11, 1924, *Nelson* (KA); prairie, Riley Co., Sept. 18, 1895, *Norton* (MBG, NYB, KA, NMC); south of Smith Hill, June 1867, *Parry* (MBG); common at Salina, June 1, 1867, *Parry* (MBG); no definite locality, Oct. 1934, *Pennell 19329* (MBG); Wichita, May 1903, *Poole 75* (GH); vicinity of South Haven, along the road, 4 mi. east of town, July 4, 1929, *Rydborg & Imler 579* (NYB); vicinity of Coldwater, camp ground, July 6, 1929, *Rydborg & Imler 676* (NYB); Emporia, May 13, 1890, *Tyler* (MBG); Wichita, Sedgwick Co., May 1929, *Wellman* (WU); Cowley Co., April 1898, *White* (MBG); open knolls 5 mi. north of Manhattan, Riley Co., May 16, 1935, *Williams & Williams 2110* (MBG); prairies near Pleasant Valley Creek, 150 mi. southwest of Independence, May 28, 1846, *Wislizenus* (MBG).

OKLAHOMA: dry open places  $\frac{1}{2}$  mi. east of Norman, April 29, 1927, *Babb 120* (UO); Woodward, Aug. 29, 1892, *Bailey* (GH); dry upland 4 mi. east of Norman, April 30, 1928, *Barkley* (UO); open prairie 2 mi. southwest of Norman, June 18, 1928, *Berry 45* (UO); Huntsville, Kingfisher Co., April 28, 1896, *Blankinship* (GH, WU); Lincoln Co., May 6, 1896, *Blankinship* (GH); Huntsville, Kingfisher Co., May 20, 1896, *Blankinship* (MBG); common, Catoosa, May 8, 1895, *Bush 910* (MBG, NYB, ND, UM); without definite locality, coll. of 1877, *Butler 4* (MBG); Arbuckle Mtns. above Turner Falls, Davis, Murray Co., April 24, 1936, *Demaree 12282* (UT); prairie north of Woodward, Woodward Co., June 5, 1901, *Eggert* (MBG); Cherokees, June 1835, *Engelmann 179* (MBG); dry waste land or native grass land, Spike Hill, Arbuckle Mtns. April 4, 1927, *Fieder 86* (UO); Arbuckle Mtns., April 27, 1935, *Goodman 2456* (MBG); breaks of Canadian River at Pack Saddle Bridge, Ellis Co., May 26, 1935, *Goodman 2583* (MBG); rich soil east of Norman, May 4, 1930, *Gowan 63* (UO); prairies  $2\frac{1}{2}$  mi. north of Norman, May 8, 1930, *Gowan* (UO); grassy creek valley near Mannsville, Johnston Co., May 5, 1916, *Griffith 3493* (MBG, GH); Norman, May 5, 1917, *Jeffs* (UO); prairie northeast of Oklahoma City, April 29, 1928, *Johnston* (UO); Fort Supply, *Kimball* (MBG); west of Alva, June 1, 1931, *McKelvey 2496* (GH); west of Tulsa, June 2, 1931,



*McKelvey 2513* (GH); Platt Nat. Park, top of Bromide Mtn., April 5, 1935, *Merrill 80* (NYB); Stillwater, May 1, 1897, *Myers* (OAM); in open places near Sulphur, June 15, 1930, *Ruth 1616* (USN); grassy side of Red Butte near Cora, Woods Co., May 21, 1913, *Stevens 545* (GH,UM); prairie near Alva, Woods Co., May 22, 1915, *Stevens 547½* (MBG,GH,NYB,UM); in open dry woods near Miami, Ottawa Co., Aug. 26, 1913, *Stevens 2291* (GH,NYB).

TEXAS: northern Texas, May, *Buckley* (ANSP,TYPE of *B. tezana* Buckl.); near McKinney, April 11, 1904, *Freeman* (MBG); Lipscomb, July 1, 1903, *Howell 6* (USN); 7 mi. east of McLean, Wheeler Co., *Hubricht, Shoop, Heinze B1451* (MBG); Leonard, Collin Co., May 1, 1886, *Merrill* (NYB); Bonheur, April 25, 1896, *Milligan 9516* (WU); Grayson Co., April 10, 1933, *Polson* (UT); limestone bluff, Dallas, 1880, *Reverchon 183* (MBG); prairies, Sherman, April 22, 1904, *Reverchon 4293* (MBG,GH,NYB); waste places, vicinity of Dallas, April 27, 1929, *Stephenson 168* (UT).

CULTIVATED SPECIMENS: ex Hort. Hamb. "A." 1827, *Lehmann* (GH,TYPE).

**48. *B. minor* Lehm. var. *aberrans* Larisey, var. nov.<sup>42</sup>**

As the species except: branches usually subdichotomous-ascending rather than dichotomous-spreading-drooping; leaflets obovate-oblongate; racemes occasionally intercalary, flowers frequently somewhat smaller; occurs out of natural range.

Distribution: dry open ground or hills, central North Carolina southwest to northwestern Georgia and adjacent Tennessee.

CITATION OF SPECIMENS:

NORTH CAROLINA: Stokes Co., June 1896, *Ashe* (MBG,OU); open dry ground, Durham, Durham Co., May 27, 1930, *Blomquist* (DU); upper New Hope Creek, Duke Forest, Orange Co., May 8, 1933, *Lynn* (DU); Durham, Durham Co., May 1917, *Wolfe* (DU).

GEORGIA: sandy roadside 8.5 mi. south of Chickamauga, Walker Co., April 24, 1938, *Pyron & McVaugh 2690* (MBG,TYPE).

TENNESSEE: hills above Chattanooga, May 25, 1876, *Engelmann* (MBG); Chattanooga, June 11, 1883, *James* (OU).

**49.  $\times$  *B. bicolor* Greenman & Larisey in Am. Jour. Bot. 26. 539. 1939.**

= *B. minor*  $\times$  *leucophaea*.

Plant less than 1 m. high, tawny-pubescent in parts, blackening slightly in drying; stem somewhat stout, heavily ribbed, finely pubescent to glabrate, somewhat glaucous, simple below,

<sup>42</sup>Ab specie differt ramis plerumque subdichotomo-ascendentibus haud dichotome patulo-nutantibus; foliolis obovato-oblongatis; racemis subinde intercalatis; floribus frequenter paulo minoribus.



subdichotomously branched and divaricately spreading above; leaves subsessile to short-petiolate, petioles 2–4 mm. long; leaflets spatulate-oblongate to narrowly obovate, 1.5–5.5 cm. long, 0.5–1 cm. broad, glabrous or sparingly pubescent toward the base and along the midrib and margins; stipules triangular to ovate-lanceolate, 0.5–2 cm. long, usually persistent; racemes axillary, 1–3.5 dm. long, frequently flexuous, not usually secund; floral bracts ovate to lanceolate-acuminate, 0.9–1.7 cm. long, usually persistent, occasionally caducous; pedicels stout, 0.5–2 cm. long, glabrate; calyx-tube 1 cm. deep, upper lip entire, ovate, or slightly emarginate, lobes of the lower lip deltoid, 3–3.5 mm. long; corolla bicolorous, standard purple, 2–2.2 cm. high, 1.8–2 cm. broad, wings and keel cream or yellow, 2–2.4 cm. long; ovary densely pubescent, mature pod oblongoid, barely inflated, somewhat distorted, narrowed at both ends, tapering gradually into a long stipe and persistent style, body 2.5–3.5 cm. long, 0.8–1.2 cm. broad, strongly reticulate, somewhat strigillose.

Distribution: prairies, southwestern Missouri, Kansas, and Oklahoma.

CITATION OF SPECIMENS:

MISSOURI: glades, Dittmer, Jefferson Co., May 4, 1930, *Kellogg 15216* (MBG); frequent on upland prairies, Webb City, Jasper Co., May 4, 1902, *Palmer 127* (MBG, TYPE); rocky upland prairies near Webb City, Jasper Co., May 10, 1931, *Palmer 39282* (MBG, GH, NYB).

KANSAS: rich, black soil, stony prairie land 1 mi. southwest of College, Riley Co., May 7, *Bayliss* (KA); on hills west of Poor House, April 13, *Dolby* (KA); about 2½ mi. southwest of Iron Mound, Saline Co., May 3, 1930, *Hancin 215* (KA); hill-top near Manhattan, Riley Co., May 21, 1920, *Herr 9* (KA); Manhattan, Riley Co., May 12, *Kellerman* (KA).

OKLAHOMA: prairie near Tecumseh, April 22, 1932, *Barkley 47* (MBG, UO); prairie 2 mi. east of Norman, May 10, 1924, *Bruner* (USN); Fort Sill, Comanche Co., April 17, 1916, *Clemens 11623* (GH); 6 mi. northwest of Stillwater, May 18, 1931, *Featherly* (MBG); Ripley, July 17, 1931, *Featherly* (MBG); in open woodlands, southern Okla., near Interstate Bridge, April 11, 1928, *Nelson 10816* (MBG).

EXCLUDED SPECIES

*Baptisia fraxinifolia* Nutt. Mss. ex Torr. & Gray, Fl. N. Am. 1: 387. 1840 = *THERMOPSIS FRAXINIFOLIA* M. A. Curtis, fide Index Kew.

*B. Hugerii* Small in Bull. Torr. Bot. Club **25**: 139. 1896 = *THERMOPSIS MOLLIS* (Michx.) M. A. Curt. ex A. Gray in Mem. Am. Acad. N. S. **3**: 47, fig. 9. 1848.

*B. mollis* (Michx.) Nutt. Gen. N. Am. Pl. **1**: 281. 1818 = *THERMOPSIS FRAXINIFOLIA* M. A. Curtis, fide Index Kew.

*B. mollis* (Michx.) DC. Prodr. **2**: 100. 1825 = *THERMOPSIS MOLLIS* M. A. Curtis ex Gray, fide Index Kew.

*B. nepalensis* Hook. Exot. Fl. **2**: pl. 131. 1825 = *PIPTANTHUS NEPALENSIS* Sweet, fide Index Kew.

*B. triflora* Loudon, Ladies' Fl. Gard. Orn. Perenn. pl. 34. 1843. in Ic. = "*RAFANIA TRIFLORA* Thunb. in textu. 137."

#### DOUBTFUL SPECIES AND NOMINA NUDA

*BAPTISIA RETUSA* Raf. New Fl. N. Am. **2**: 47. 1836 [1837].

Efforts to obtain authentic material or information additional to that given in Rafinesque's description were unsuccessful. His description is not sufficiently clear to warrant placing it in any known species with certainty.

*BAPTISIA LUPINOIDES* Burbidge in Gard. Chron. **21**: 827. Jan.-June 1884.

This plant was in cultivation in England, and from the description given it is impossible to place it definitely in any recognized species. No authentic material could be located, and reference to it appears no place else in the literature.

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<i>bracteata</i> .....	155, 156	<i>lanceolata</i> .....	121, 148
<i>cinerea</i> .....	181	<i>perfoliata</i> .....	141
<i>fulva</i> .....	181	<i>tinctoria</i> .....	121, 183
<i>reticulata</i> .....	148	<i>villosa</i> .....	121, 181
<i>Pericaulon</i> .....	122, 136	<i>Thermopsis</i> .....	122, 134
<i>cordatum</i> .....	141	<i>fraxinifolia</i> .....	207
<i>microphyllum</i> .....	142	<i>mollis</i> .....	208
<i>perfoliatum</i> .....	141		



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## EXPLANATION OF PLATE

## PLATE 16

SEEDLING STUDIES IN *B. AUSTRALIS* SHOWING ORIGIN OF  
LEAVES AND STIPULES

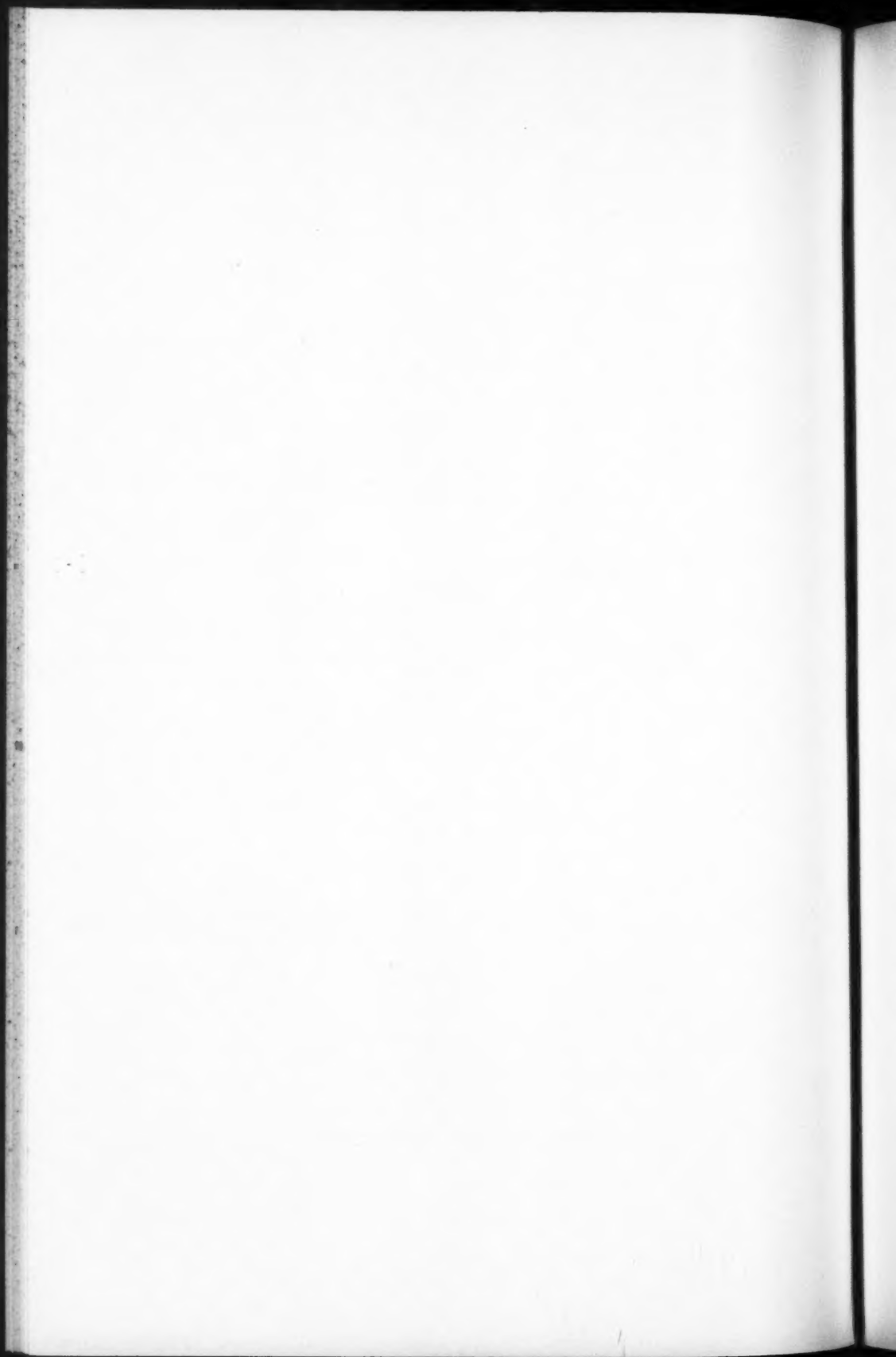
Figs. 1-5. Normal development: no fusion of stipules with primary, unifoliate leaf.

Fig. 6. Abnormal development: fusion of one stipule with primary leaf.

Figs. 7-11. Series illustrating origin of trifoliate, stipulate leaves from basal scales.



LARISEY—MONOGRAPH OF BAPTISIA





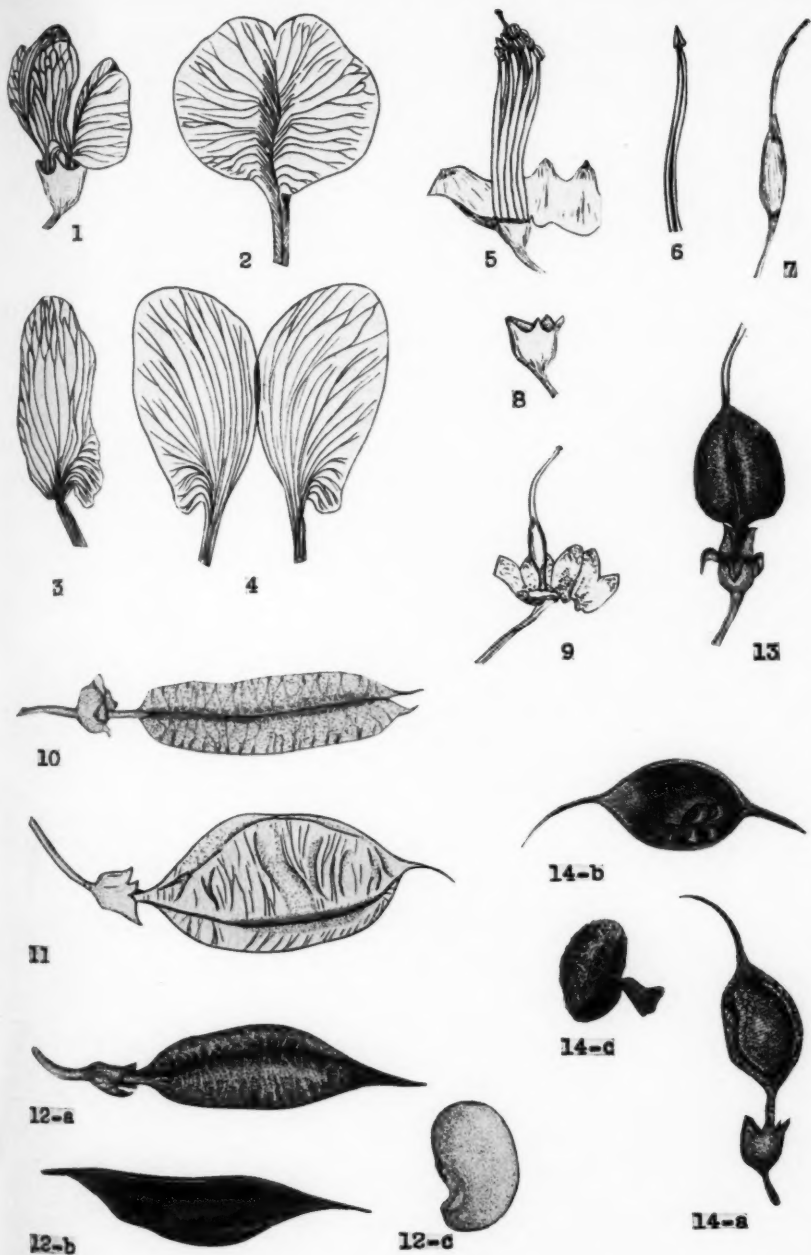
## EXPLANATION OF PLATE

## PLATE 17

## FLORAL AND FRUIT CHARACTERS

- Fig. 1. Flower, *B. tinctoria* ( $\times 1\frac{1}{4}$ ).  
Fig. 2. Standard, *B. tinctoria* ( $\times 2\frac{1}{2}$ ).  
Fig. 3. Wing, *B. tinctoria* ( $\times 2\frac{1}{2}$ ).  
Fig. 4. Keel petals, *B. tinctoria* ( $\times 3\frac{1}{3}$ ).  
Fig. 5. Calyx dissected to show insertion of stamens, *B. tinctoria* ( $\times 2\frac{1}{2}$ ).  
Fig. 6. Stamen, *B. tinctoria* ( $\times 3$ ).  
Fig. 7. Pistil, *B. tinctoria* ( $\times 3$ ).  
Fig. 8. Calyx, *B. tinctoria* ( $\times 1\frac{2}{3}$ ).  
Fig. 9. Calyx dissected to show insertion of pistil, *B. perfoliata* ( $\times 1\frac{1}{2}$ ).  
Fig. 10. Mature pod, *B. alba* ( $\times 1\frac{2}{3}$ ).  
Fig. 11. Mature pod, *B. megacarpa* ( $\times \frac{5}{6}$ ).  
Fig. 12. a. mature pod, *B. minor*; b. one side removed to show persistent ligneous funicle ( $\times \frac{5}{6}$ ); c. ovule ( $\times 6\frac{1}{4}$ ).  
Fig. 13. Mature pod, *B. perfoliata* ( $\times 1\frac{2}{3}$ ).  
Fig. 14. a. mature pod, *B. tinctoria*; b. one side removed to show insertion of ovules ( $\times \frac{5}{6}$ ); c. ovule ( $\times 8\frac{1}{3}$ ).





LARISEY—MONOGRAPH OF BAPTISIA





## EXPLANATION OF PLATE

## PLATE 18

## TYPES OF LEAVES

Figs. 1-4. Ternately compound types of leaves.

Fig. 1. Leaf of *B. australis* ( $\times \frac{5}{6}$ ).

Fig. 2. Leaf of *B. alba* ( $\times 1\frac{2}{3}$ ).

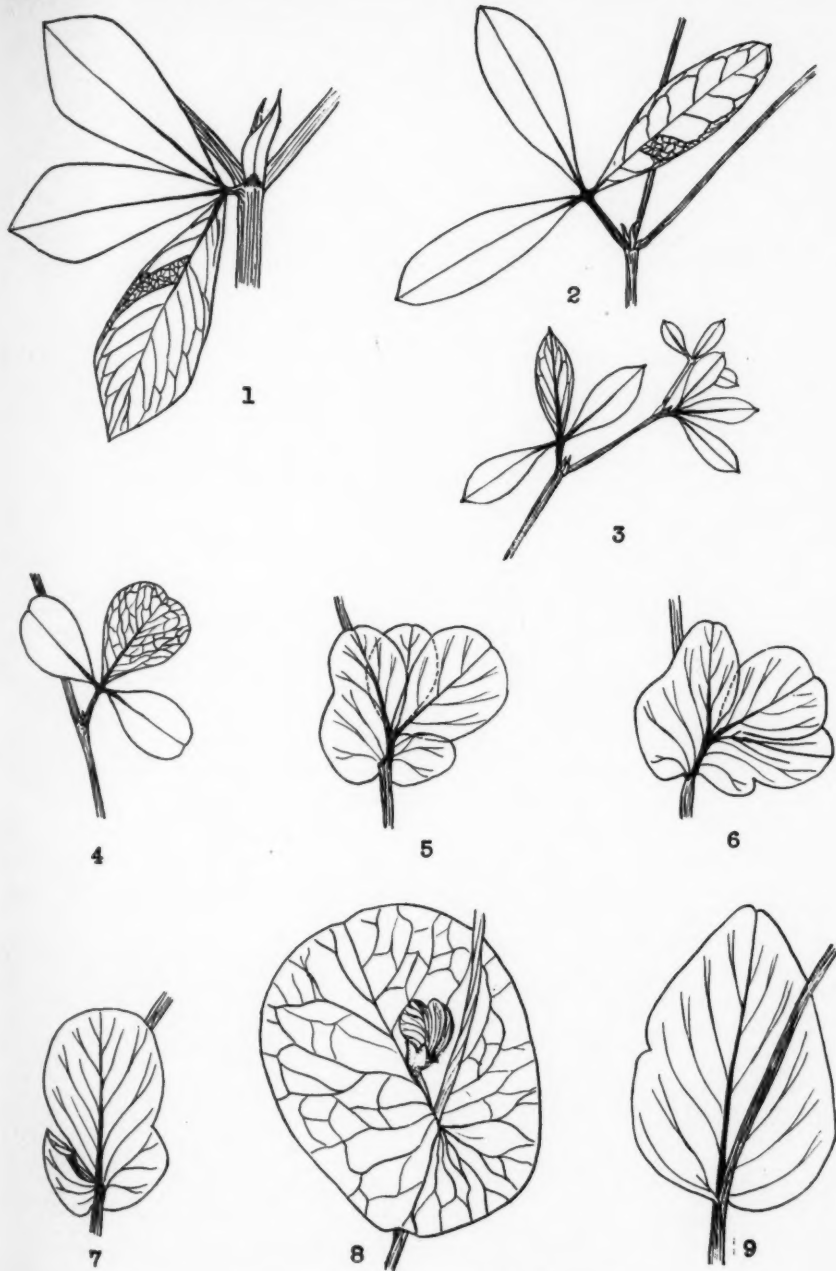
Fig. 3. Leaf of *B. minor* ( $\times \frac{5}{6}$ ).

Fig. 4. Leaf of *B. tinctoria* ( $\times 2\frac{1}{2}$ ).

Figs. 5, 6, & 7. Transition stages from compound to simple leaf type in *B. microphylla* ( $\times \frac{5}{6}$ ).

Fig. 8. Perfoliate leaf of *B. perfoliata* ( $\times \frac{5}{6}$ ).

Fig. 9. Simple leaf of *B. simplicifolia* ( $\times \frac{5}{6}$ ).



LARISEY—MONOGRAPH OF BAPTISIA







## EXPLANATION OF PLATE

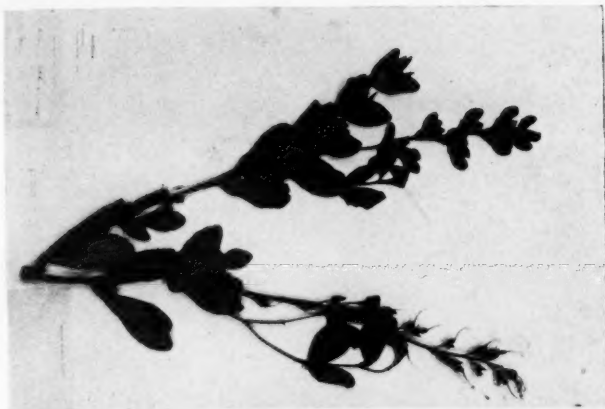
## PLATE 19

Fig. 1. *B. sphaerocarpa* Nutt. From *Butler s.n.*, in Herbarium of the Missouri Botanical Garden.

Fig. 2.  $\times$  *B. sulphurea* Engelm. From type specimen, *Butler s.n.*, in Herbarium of the Missouri Botanical Garden.

Fig. 3. *B. leucantha* Torr. & Gray. From *Butler s.n.*, in Herbarium of the Missouri Botanical Garden.

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LARISEY—MONOGRAPH OF BAPTISIA





## EXPLANATION OF PLATE

## PLATE 20

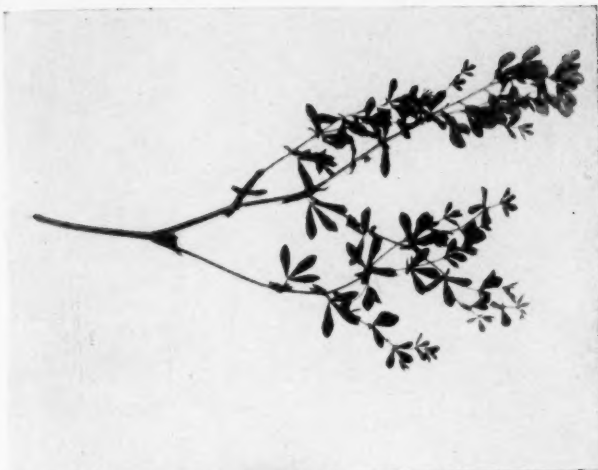
Fig. 1. *B. minor* Lehm. From *Anderson s.n.*, in Herbarium of the Missouri Botanical Garden.

Fig. 2.  $\times$  *B. bicolor* Greenman & Lariacy. From type specimen, *Palmer 127*, in Herbarium of the Missouri Botanical Garden.

Fig. 3. *B. leucophaca* Nutt. From *Cruikshanks* [Crookshanks] 7, in Herbarium of the Missouri Botanical Garden.



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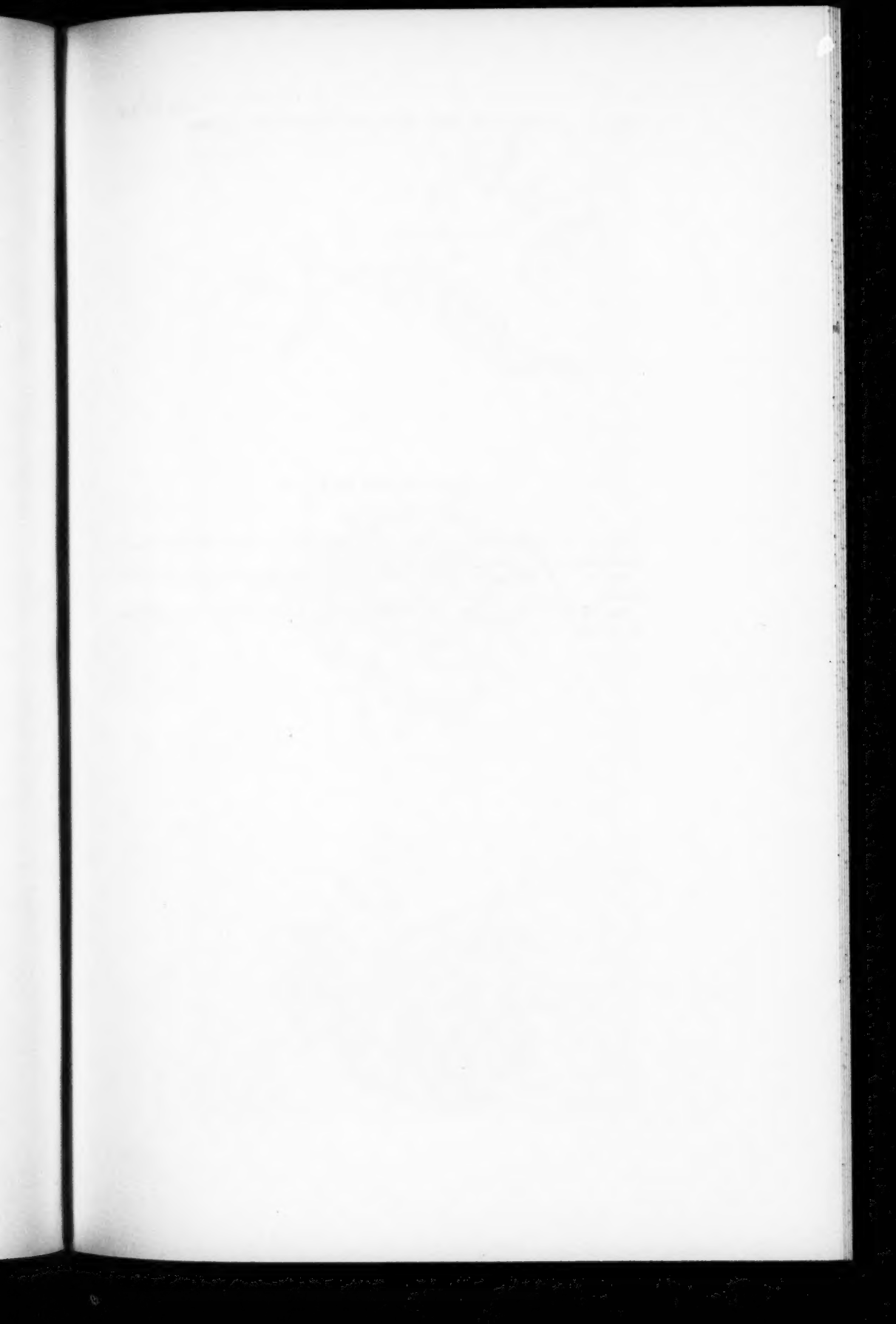
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## EXPLANATION OF PLATE

## PLATE 21

Fig. 1. *B. leucophaca* Nutt. var. *glabrescens* Larisey. From *Brainerd s.n.*, in Herbarium of the Missouri Botanical Garden.

Fig. 2.  $\times$  *B. intermedia* Larisey. From cotype, *Harper 3476*, in the Gray Herbarium.

Fig. 3. *B. viridis* Larisey. From *Harper 3475*, in the United States National Herbarium.

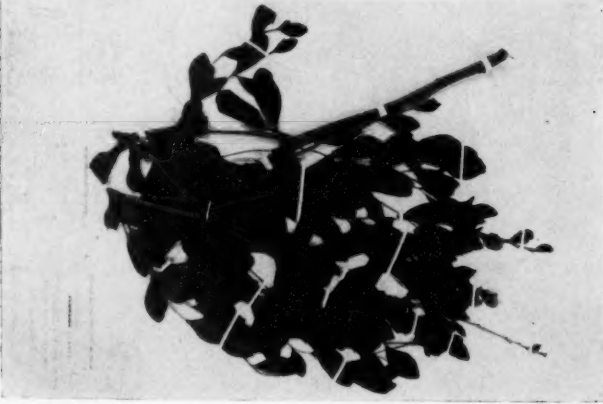
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LARISEY—MONOGRAPH OF BAPTISIA







## EXPLANATION OF PLATE

## PLATE 22

Fig. 1. *B. leucantha* Torr. & Gray. From *Anderson & Hubricht s.n.*, in Herbarium of the Missouri Botanical Garden.

Fig. 2.  $\times$  *B. fragilis* Larisey. From type specimen, *Anderson & Hubricht s.n.*, in Herbarium of the Missouri Botanical Garden.

Fig. 3. *B. viridis* Larisey. From *Anderson & Hubricht s.n.*, in Herbarium of the Missouri Botanical Garden.

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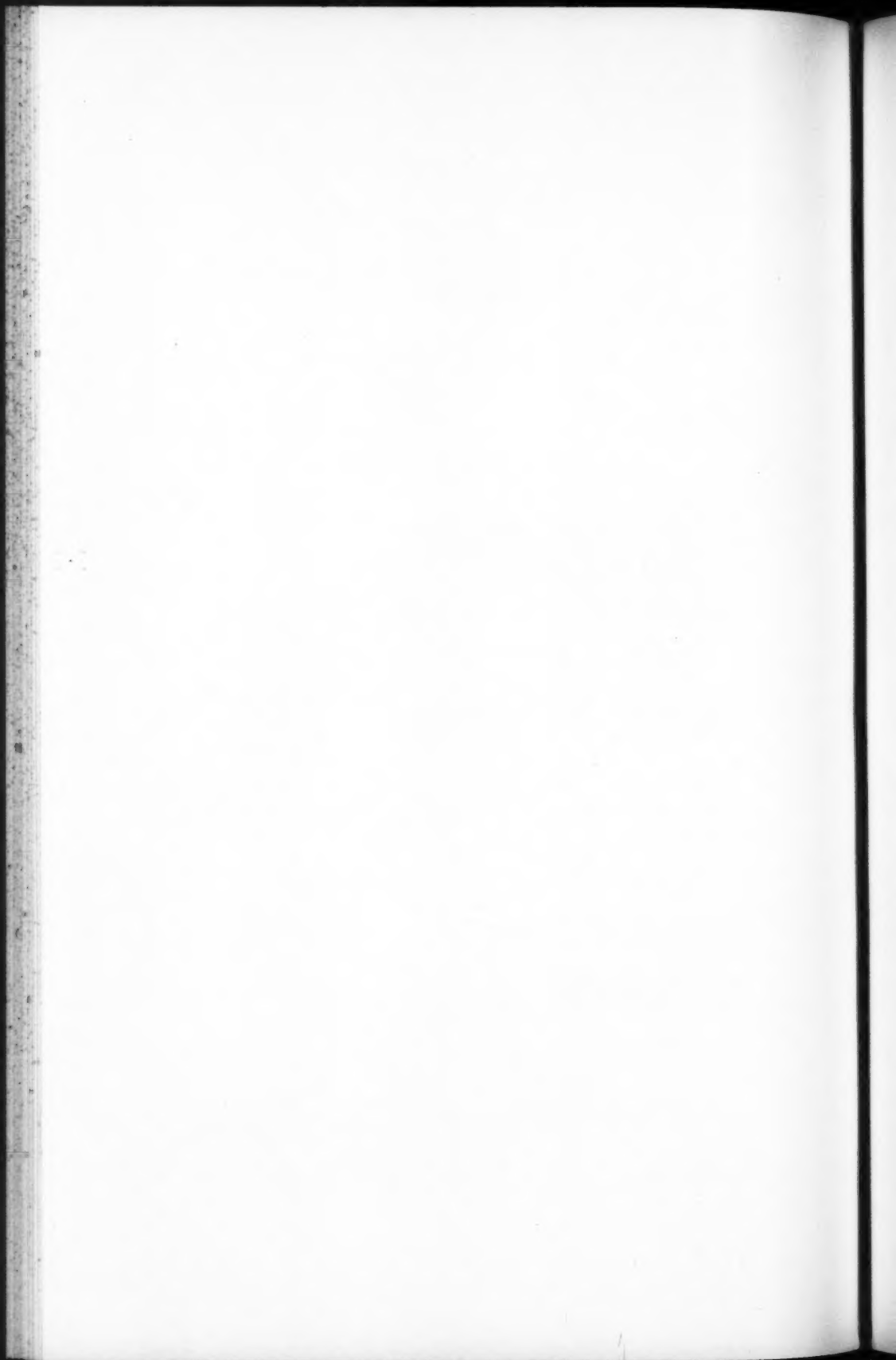


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## EXPLANATION OF PLATE

## PLATE 23

Fig. 1. *B. tinctoria* (L.) Vent. var. *crebra* Fern. From *Deam 58,996*, in Herbarium of the Missouri Botanical Garden.

Fig. 2.  $\times$  *B. Deamii* Larisey. From type specimen, *Deam 58,994*, in Herbarium of the Missouri Botanical Garden.

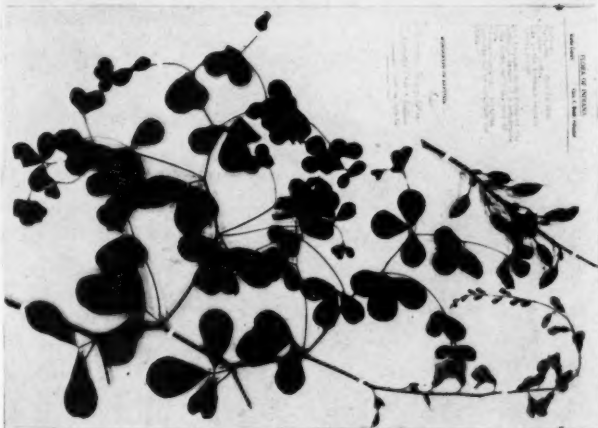
Fig. 3. *B. leucantha* Torr. & Gray. From *Deam 58,992*, in Herbarium of the Missouri Botanical Garden.



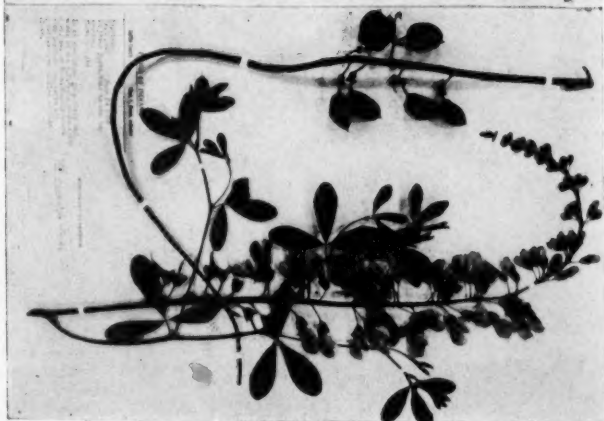
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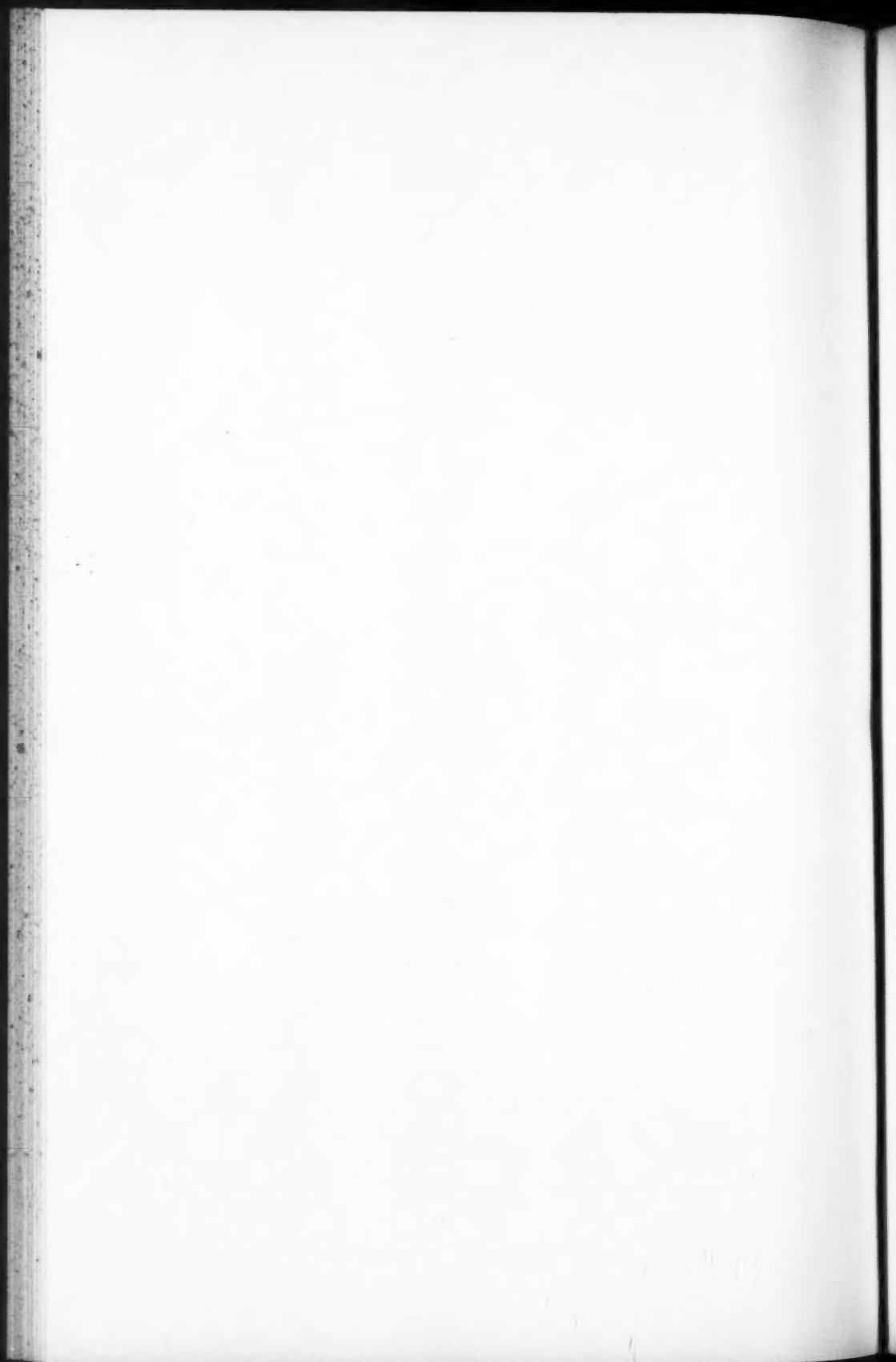
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LARISEY—MONOGRAPH OF BAPTISIA





## EXPLANATION OF PLATE

## PLATE 24

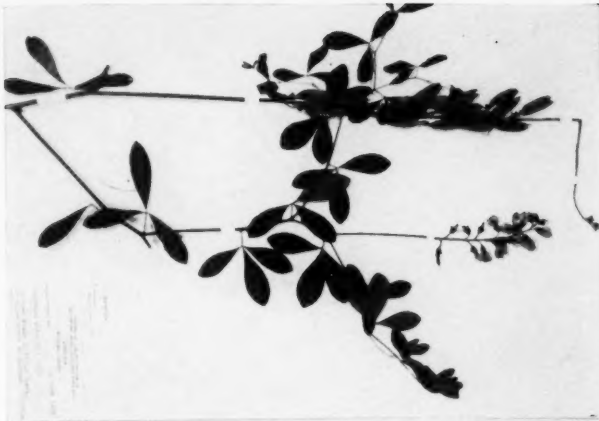
Fig. 1. *B. alba* (L.) Vent. From *Jones s.n.*, in Herbarium of the Missouri Botanical Garden.

Fig. 2.  $\times$  *B. pinctorum* Larisey. From type specimen, *Jones s.n.*, in Herbarium of the Missouri Botanical Garden.

Fig. 3. *B. tinctoria* (L.) Vent. var. *crebra* Fern. From *Jones s.n.*, in Herbarium of the Missouri Botanical Garden.

LARISEY—MONOGRAPH OF BAPTISIA

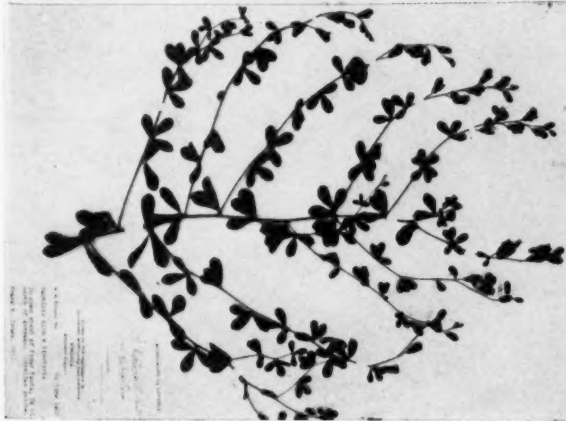
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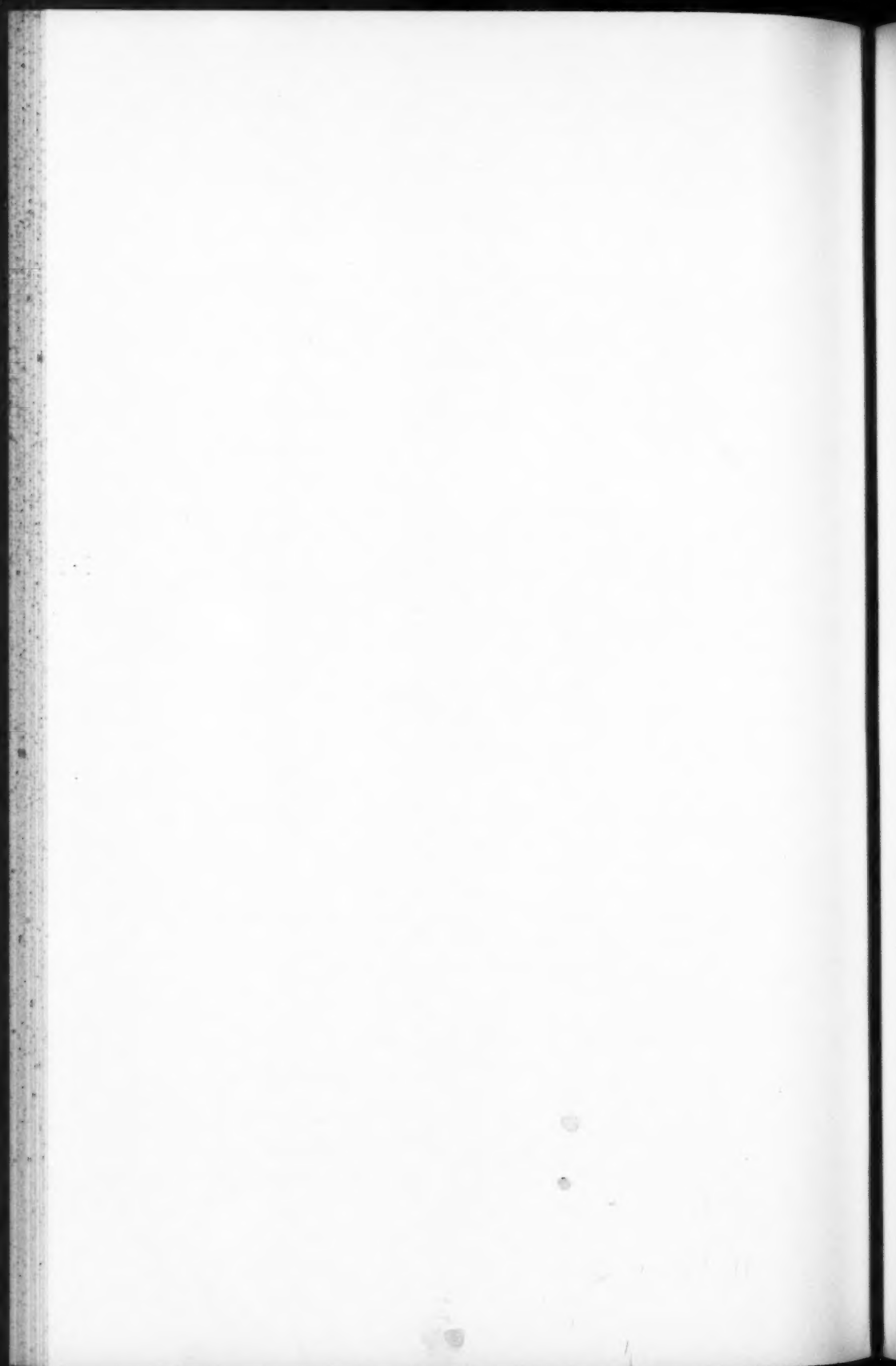


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## EXPLANATION OF PLATE

## PLATE 25

Fig. 1. *B. pendula* Larisey. From type specimen, *Curtiss 6810*, in Herbarium of the Missouri Botanical Garden.

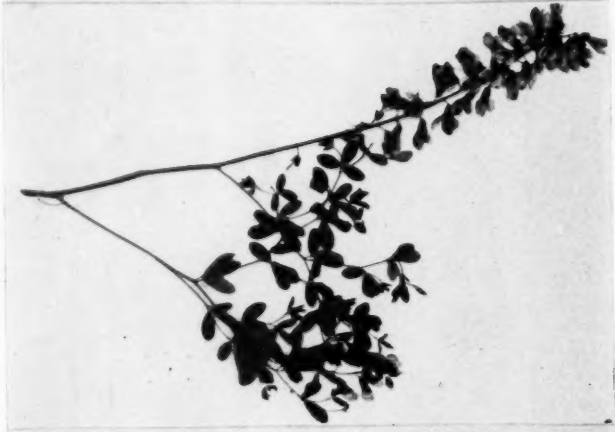
Fig. 2. *B. pendula* Larisey var. *obovata* Larisey. From type specimen, *Coker s. n.*, in Herbarium of the University of North Carolina.

Fig. 3. *B. pendula* Larisey var. *macrophylla* Larisey. From type specimen, *Palmer 17,935*, in Herbarium of the Missouri Botanical Garden.

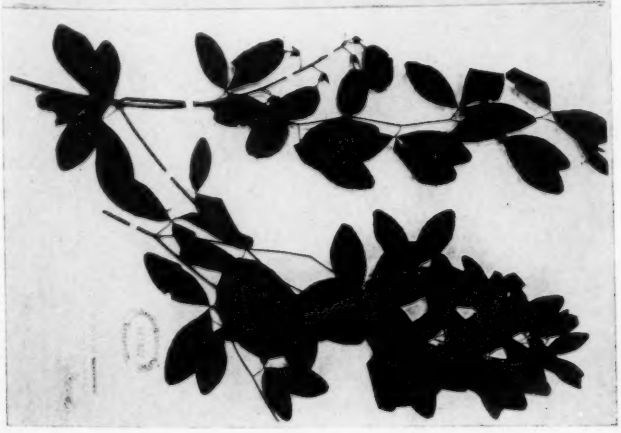
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LARISEY—MONOGRAPH OF BAPTISIA





## EXPLANATION OF PLATE

## PLATE 26

Fig. 1. *B. riparia* Larisey. From type specimen, *Totten s.n.*, in Herbarium of the University of North Carolina.

Fig. 2. *B. riparia* Larisey var. *minima* Larisey. From type specimen, *Griscom 21581*, in Gray Herbarium.

Fig. 3. *B. psammophila* Larisey. From type specimen, *Biltmore Herb. H/6046*, in Gray Herbarium.

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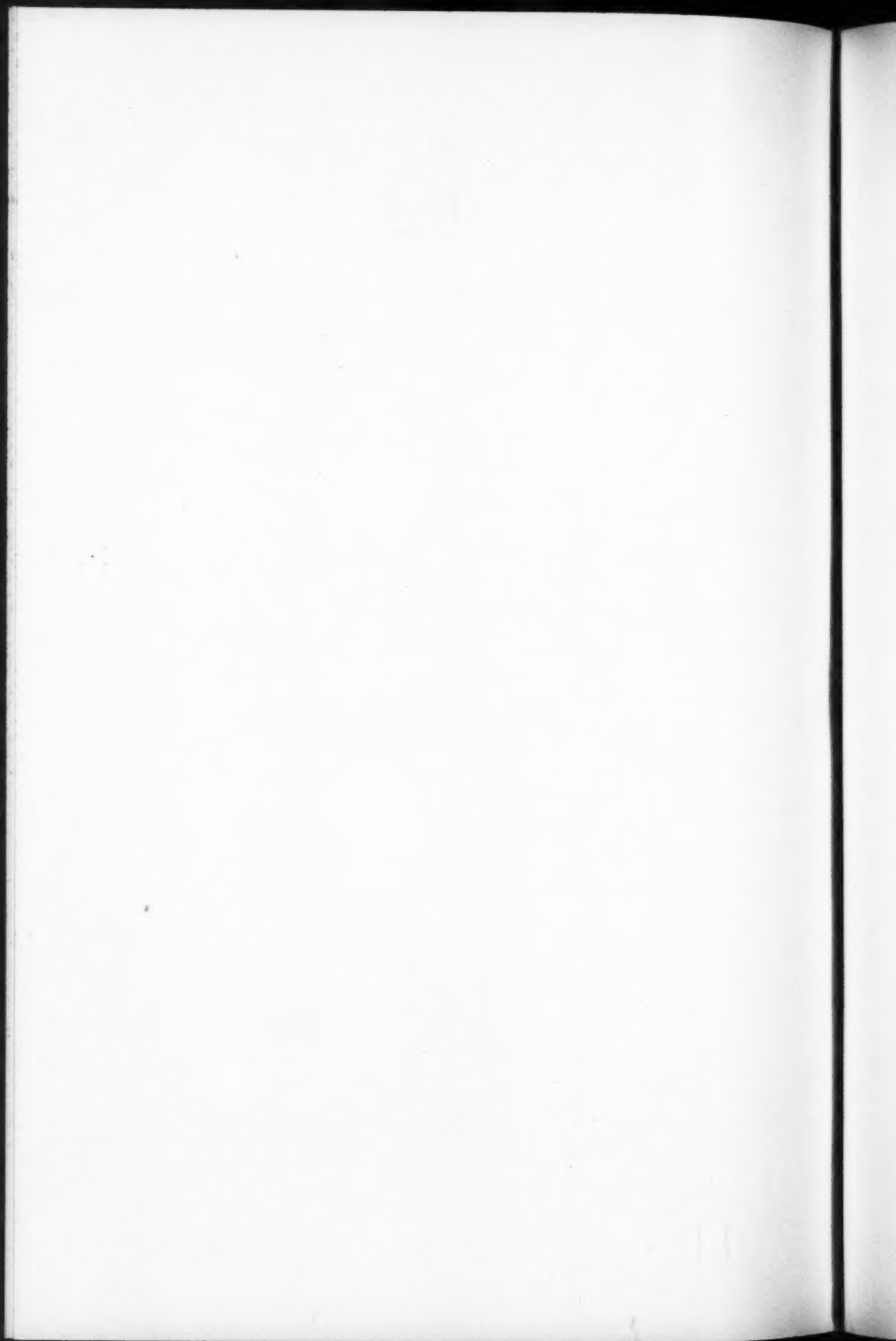


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LARISEY—MONOGRAPH OF BAPTISIA







## EXPLANATION OF PLATE

## PLATE 27

Fig. 1. *B. intercalata* Larisey. From cotype specimen, *Langlois s.n.*, in Herbarium of the New York Botanical Garden.

Fig. 2. *B. intercalata* Larisey. From type specimen, *Langlois s.n.*, in Herbarium of the New York Botanical Garden.

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LARISEY—MONOGRAPH OF BAPTISIA

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## EXPLANATION OF PLATE

## PLATE 28

Fig. 1. *B. macilenta* Small ex Larisey. From type specimen, *Langlois s. n.*, in Herbarium of the New York Botanical Garden.

Fig. 2. *B. leucantha* Torr. & Gray var. *divaricata* Larisey. From type specimen, *Langlois s. n.* in Herbarium of the University of Wisconsin.

Fig. 3. *B. leucantha* Torr. & Gray var. *pauciflora* Larisey. From type specimen, *Langlois 10*, in Herbarium of the New York Botanical Garden.



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# A REVISION OF THE NORTH AMERICAN SPECIES OF THE GENUS *THERMOPSIS*<sup>1</sup>

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Washington University*

## INTRODUCTION

During a monographic treatment of the genus *Baptisia*, interest was aroused in the state of taxonomic confusion into which its closest generic affinity, *Thermopsis*, had fallen. According to the "Index Kewensis" and the Gray Herbarium Catalogue, it is comprised of thirty species: eight Asiatic, not considered in this revision; and twenty-two North American—four from the southeastern United States, and eighteen from the western United States. The latter group constitutes a western geographical supplement of *Baptisia* whose western limits roughly coincide with the eastern limits of *Thermopsis*.

The problems were found to be largely bibliographical. The present treatment proposes no novelties, but has indicated two new combinations. It consists largely of a drastic reduction of a number of species. The four heretofore recognized southeastern species are reduced to three, and the eighteen western species have been reduced to seven species and five varieties. A key to the species, and brief descriptions with complete citations of synonyms and type or authentic specimens are given.

Relative uniformity, particularly within the western group, makes delimitation of entities difficult in many cases. As in *Baptisia*, flower structure furnishes little of value in this respect, and has therefore been given little emphasis. Fruit and vegetative characters seem to be the best bases for the separation of species, and have been stressed accordingly. Considerable doubt is felt by the author as to the validity of the two varieties of *T. rhombifolia*: *annulocarpa* and *arenosa*, for they

<sup>1</sup> Issued May 10, 1940.

are frequently difficult to distinguish from the species. Likewise, *T. pinetorum* and *T. divaricarpa* are separated on rather weak bases. However, a consideration of geographical distribution substantiates their individuality. All others seem fairly distinct.

Appreciation is expressed to the following institutions through whose cooperation and facilities this work was made possible: The Missouri Botanical Garden, the Gray Herbarium of Harvard University, the New York Botanical Garden, the Academy of Natural Sciences of Philadelphia, the Field Museum of Natural History, Duke University, the University of North Carolina, the University of Colorado, the University of Wyoming, and the University of California.

#### ABBREVIATIONS

MBG—Missouri Botanical Garden.

GH—Gray Herbarium.

ANSP—Academy of Natural Sciences of Philadelphia.

FM—Field Museum.

COL—University of Colorado.

WYO—University of Wyoming.

CAL—University of California.

#### TAXONOMY

**Thermopsis** R. Br. in Ait. Hort. Kew. ed. 2, 3: 3. 1811.

*Thermia* Nutt. Gen. N. Am. Pl. 1: 282. 1818.

*Scolobus* Raf. in Jour. Phys. 89: 259. 1819.

*Drepilia* Raf. New Fl. N. Am. 2: 52. 1836 [1837].

Perennial herbs with woody rhizomes. Plant usually less than 1 m. high, more or less pubescent throughout. Stem slender or stout, simply branched, branches erect or divaricate. Stipules conspicuous, persistent, frequently foliaceous, ovate-cordate to lanceolate-acuminate, 1–5 cm. long. Petioles 1–4 cm. long. Leaves trifoliolately compound, leaflets linear, elliptic, oblanceolate, or obovate, 3–8 cm. long. Flowers racemose, racemes terminal or axillary, compact or lax, few- to many-flowered. Floral bracts conspicuous, semi-persistent, ovate-cordate to lanceolate, 0.6–1.2 cm. long. Pedicels 1–3 cm. long. Calyx-tube campanulate, bilabiate, upper lip truncate to emar-

ginate, lobes of the lower lip deltoid to lanceolate, usually one-half the length of the tube. Corolla papilionaceous, pale through deep yellow, 1–1.5 cm. in length. Legume sessile or very short-stipitate, usually linear, occasionally elliptic, not inflated, occasionally lomentaceous, straight, recurved, or annular, ascending or divaricate, 5–10 cm. long.

Distribution: North America: southeastern and western United States. Asia.

#### KEY TO THE SPECIES

- 1a. Plants of the southeastern United States
  - 1b. Stipules foliaceous.....1. *T. caroliniana*
  - 2b. Stipules not foliaceous
    - 1c. Leaflets 2–4 cm. long.....2. *T. mollis*
    - 2c. Leaflets 5–7 cm. long.....3. *T. frazinifolia*
- 2a. Plants of the western United States
  - 1b. Pods divaricate
    - 1c. Pods more or less recurved
      - 1d. Plants from North Dakota and Saskatchewan, south to Nebraska and Colorado
        - 1e. Plant sparsely appressed-pubescent.....4. *T. rhombifolia*
        - 2e. Plant densely silvery-pubescent....5. *T. rhombifolia* var. *annulocarpa*
        - 3e. Plant glabrate.....6. *T. rhombifolia* var. *arenosa*
      - 2d. Plants from Oregon and California
        - 1e. Plant sparingly strigose.....13. *T. gracilis*
        - 2e. Plant silvery-canescens.....14. *T. gracilis* var. *argentata*
        - 3e. Plant glabrate.....15. *T. gracilis* var. *venosa*
    - 2c. Pods virtually straight.....7. *T. divaricarpa*
  - 2b. Pods ascending
    - 1c. Pods glabrate.....8. *T. pinetorum*
    - 2c. Pods conspicuously pubescent
      - 1d. Leaflets linear.....9. *T. montana*
      - 2d. Leaflets obovate to broadly elliptic
        - 1f. Plant softly pubescent to glabrate.....10. *T. ovata*
        - 2f. Plant woolly-tomentose.....11. *T. macrophylla*
        - 3f. Plant silvery-silky canescens.....12. *T. macrophylla* var. *velutina*

#### 1. *T. caroliniana* M. A. Curt. in Am. Jour. Sci. I. 44: 80. 1843.

Plant 0.8–1 m. high; stem stout, sparingly pubescent to glabrate, erect, simply branched; stipules foliaceous, clasping, broadly ovate, 4–5 cm. long, 2–3 cm. broad; petioles 4–6 cm. long; leaflets obovate, glaucous and finely appressed-pubescent below, 5–8 cm. long, 2.5–4 cm. broad; raceme compact, erect, 1.5–2.5 dm. long; bracts ovate, 3–6 mm. long, caducous; pedi-

cels 2-4 mm. long; calyx-tube silky villous; legume firm, densely villous, straight, appressed to rachis, 4-5 cm. long.

Distribution: North Carolina to Georgia and Tennessee.

CITATION OF SPECIMENS:

NORTH CAROLINA: open woods near Highlands, Macon Co., July 3, 1897, *Biltmore Herb. 133b* (MBG); Highlands, 1889, *Boynston* (MBG); in montibus Carolinae et Georgiae, 1842, *Buckley* (MBG); Haywood Co., *Curtis* (GH, probable TYPE).

GEORGIA: banks of Tallulah River below Berton P. O., Aug. 18-20, 1893, *Small* (MBG).

TENNESSEE: hills around Nashville, *Gattinger, Curt. 700* (MBG); Harpeth hills near Nashville, 1875, *Gattinger* (MBG).

**2. *T. mollis* (Michx.) M. A. Curt. ex A. Gray in Mem. Am. Acad. N. S. 3: 47, fig. 9. 1848.**

*Podalyria mollis* Michx. Fl. Bor. Am. 1: 264. 1803.

*Baptisia mollis* (Michx.) DC. Prodr. 2: 100. 1825.

*Baptisia Hugerii* Small in Bull. Torr. Bot. Club 25: 139. 1898.

*Thermopsis Hugerii* Small, Fl. Southeast. U. S. 596, 1331. 1903.

Plant 3-5 cm. high, softly pubescent throughout; stem diffusely branched, branches slender; stipules varying from ovate to lanceolate, 0.4-1.2 cm. long; petioles 0.5-1.5 cm. long; leaflets broadly elliptic, occasionally ovate, apex acuminate, tawny-pubescent along the veins of the lower surface, 2-4 cm. long, 1-2 cm. broad; racemes compact, flexuous, 0.5-1.5 dm. long; bracts lanceolate, semi-persistent, 0.8-1 cm. long; pedicels 0.5-1 cm. long; calyx minutely pubescent; pods firm, elliptic, appressed-pubescent, divaricate, 3-4 cm. long.

Distribution: Virginia to North Carolina and Georgia.

CITATION OF SPECIMENS:

VIRGINIA: dry ridges near Hampden Sidney College, Prince Edward Co., June 1884, *Blair* (MBG).

NORTH CAROLINA: no definite locality, *Curtis* (ANSP, TYPE); no definite locality, *Curtis mis. 1842* (MBG); Statesville, *Hyams* (MBG); no definite locality, *Schweinitz* (ANSP).

GEORGIA: Cornelia, May 1, 1897, *Huger* (MBG, COTYPE of *T. Hugerii* Small).

**3. *T. fraxinifolia* (Nutt.) M. A. Curt. in Am. Jour. Sci. I. 44: 81. 1843.**

*Baptisia mollis* (Michx.) Nutt. Gen. N. Am. Pl. 1: 281. 1818.

*Baptisia fraxinifolia* Nutt. Mss. ex Torr. & Gray, Fl. N. Am. 1: 387. 1840.

Plant 4–6 dm. high, lightly appressed-pubescent throughout; stem occasionally glabrate, branched, branches geniculate, slender; stipules lanceolate, 0.8–1 cm. long, persistent; petioles 1.5–2.5 cm. long; leaflets obovate-elliptic, lower surface pubescent along the veins, 5–7 cm. long, 2–3 cm. broad; racemes loose, flexuous, 1–2 dm. long; bracts ovate-cordate, 0.5–1.5 cm. long, semi-persistent; pedicels 0.5–1.2 cm. long; calyx glabrate; pods linear, delicate, minutely pubescent, recurved, divaricate, 7–8 cm. long.

Distribution: North Carolina to Georgia and Tennessee.

CITATION OF SPECIMENS:

NORTH CAROLINA: southeastern North Carolina, *Ashe* (MBG); Pilot Mtn., July 1895, *Ashe* (MBG); rich, shady slopes, Biltmore, May 1 & 10, 1896, *Biltmore Herb. 1025* (MBG); in montibus Carolinae et Georgiae, 1842, *Buckley* (MBG); no definite locality, 1842, *Curtis* (MBG); in vicinity of Table Rock Mtn., Aug. 2, 1890, *Heller* (MBG); Asheville, June 1925, *Kraus* (MBG); no definite locality, *Nuttall* (ANSP, TYPE of *B. fraxinifolia* Nutt.); dry soil, Black Mtns., Sept. 4, 1931, *Sharp* (MBG).

TENNESSEE: Lookout Mtn., May 1869, *Canby* (MBG).

4. *T. rhombifolia* Nutt. ex Richards. in Frankl. Narr. First Journ. App. 737. 1823.

*Cytisus rhombifolius* Nutt. in Fras. Cat. 1813; Pursh, Fl. Am. Sept. Suppl. 2: 741. 1814.

*Thermia rhombifolia* Nutt. Gen. N. Am. Pl. 1: 282. 1818.

Plant 2–4 dm. high, appressed-pubescent throughout; stem slender, firm, geniculate, sparingly branched; stipules ovate-cordate, 0.5–1 cm. long; petioles 0.5–1 cm. long; leaflets obovate-cuneate to elliptic or oblanceolate, 2–3 cm. long, 1–2 cm. broad; racemes loose, usually less than 1 dm. long; bracts lanceolate, 5–7 mm. long, usually caducous; calyx-tube usually somewhat villous; pods silky villous, lomentaceous, recurved to annular, divaricate, 4–6 cm. long.

Distribution: North Dakota and Alberta, south to Nebraska and Colorado.

CITATION OF SPECIMENS:

NORTH DAKOTA: clay soil near top of butte, Medora, June 1, 1912, *Bergman* (MBG); sandy bluffs, Bismarek, May 1891, *Lantermann* (MBG).



**SOUTH DAKOTA:** hilltop near Lead, June 24, 1928, *Lee* (MBG); eroded banks and ravines, Bad Lands, near Wall, Pennington Co., June 15, 1929, *Palmer 37290* (MBG); open rocky woods near Lead, Lawrence Co., June 17, 1929; *Palmer 37352* (MBG); foothills, Black Hills, Rapid City, June 30, 1909, *White* (MBG).

**NEBRASKA:** sandy banks of Missouri, Fort Pierre, June 1853, *Hayden* (MBG); river bottoms above Council Bluffs, June 10, 1853, *Hayden* (MBG); Frankl. Exp., *Hooker* (ANSP); common in dry washes and slopes, Sioux Co., May-June 1927, *Kramer 52* (MBG); no definite locality, *Nuttall* (ANSP,TYPE).

**SASKATCHEWAN:** open hillside, Lupton, May 11, *Clokey 1800* (MBG); Estevan, June 22, 1907, *Cowles 18* (MBG).

**ALBERTA:** prairie and stubble, Craigmyle district, May 25, 1922, *Brinkman* (MBG); dry gravelly soil, Red Deer Valley, vicinity of Rosedale, May 10, 1915, *Moodie 360* (MBG).

**MONTANA:** Custer, 1890, *Blankinship 22* (MBG); Westby, June 17, 1927, *Larsen 20* (MBG).

**WYOMING:** disintegrated rocks, Ridge, Albany Co., June 18, 1901, *Goodding 38* (MBG); slate slides, Alcova, Natrona Co., June 29, 1901, *Goodding 151* (MBG); Table Mtn., June 2, 1894, *Nelson 121 & 122* (MBG); open stony ridges, Arlington, July 10, 1924, *Nelson 10145* (MBG); shale soil 8 mi. northwest of Hulett, Crook Co., June 6, 1935, *Ownbey 646* (MBG); dry soil, Telephone Canyon, Laramie Hills, Albany Co., May 30, 1936, *Ownbey 1027* (MBG); dry slopes, Bates Hole, June 20, 1926, *Payson & Payson 4760* (MBG); dry hillsides 6 mi. west of Keycee, Johnson Co., April 27, 1934, *Eollins 415* (MBG); plains at base of Cheyenne Mtn., May 4, 1891, *Smith* (MBG); dry plains, Carbon Co., May 27, 1932, *Williams 397* (MBG); in gravel, Telephone Canyon, east of Laramie, Albany Co., June 18, 1935, *Williams 2218* (MBG); pine forest, South Fork of Clear Creek, Johnson Co., June 26, 1936, *Williams & Williams 3117a* (MBG).

**COLORADO:** Canyon City, May 1871, *Brandegge 19 & 22* (MBG); infrequent on sandstone rock 5 mi. east of Boulder, April 30, 1921, *Hanson 641* (MBG); Platteville, April 17, 1908, *Johnston 462* (MBG); Fern Lake Trail, Estes Park, June 20, 1929, *Mathias 408* (MBG); Manitou, May 15, 1892, *Mulford* (MBG); on plains 2 mi. north of Simla, Elbert Co., June 23, 1937, *Ownbey 1296* (MBG); Mt. Pass, July 1, 1886, *Trelease* (MBG); Gregory Cañon, Boulder Co., May 21, 1912, *Vestal 368* (MBG).

**5. *T. rhombifolia* var. *annulocarpa* (Nels.) L. Wms. in Ann. Mo. Bot. Gard. 23: 450. 1936.**

*T. annulocarpa* A. Nels. in Bull. Torr. Bot. Club 26: 239. 1899.

As the species except somewhat more densely silvery-pubescent throughout, and pods usually completely annular.

Distribution: Wyoming.

**CITATION OF SPECIMENS:**

**WYOMING:** along roadsides, Bills' Flat, Big Horn Co., July 25, 1901, *Goodding 353* (MBG); among rocks on naked slopes near summits of Ferris Mtns., July 25, 1898, *Nelson 4971* (WYO,TYPE of *T. annulocarpa* Nels.); in clay and sandy ravines,

Fort Steele, Carbon Co., June 16, 1900, *Nelson 7252* (MBG); barren slopes above snow bank, Bates Hole, June 20, 1926, *Payson & Payson 4799* (MBG); in pine forest on South Fork of Clear Creek, Johnson Co., June 26, 1936, *Williams & Williams 3117* (MBG).

**6. *T. rhombifolia* var. *arenosa* (Nels.) Larisey, comb. nov.**

*T. arenosa* A. Nels. in Bot. Gaz. **25**: 276, *pl. 18. fig. 4.* 1898.

As the species except somewhat larger in general habit and tending to become glabrate.

Distribution: Wyoming.

CITATION OF SPECIMENS:

WYOMING: Laramie Hills, July 17, 1897, *Nelson 3182a* (WYO, TYPE of *T. arenosa* Nels.); sandy washes, Laramie Hills, June 1906, *Nelson* (MBG); sandy soil, foot of Telephone Canyon, Laramie Mtns., Albany Co., June 8, 1933, *Porter 1291 & 1329* (MBG).

**7. *T. divaricarpa* A. Nels. in Bot. Gaz. **25**: 275. 1898.**

Plant 4–6 dm. high, softly pubescent to glabrate throughout; stem slender, firm, branched; stipules ovate-lanceolate, 1.5–2.5 cm. long; petioles 1–2 cm. long; leaflets oblanceolate-elliptic, 3–4 cm. long, 1–2 cm. broad; racemes loose, erect, 1–2 dm. long; bracts ovate-lanceolate, 8–10 mm. long, usually caducous; pedicels 4–6 cm. long; calyx-tube softly pubescent to glabrate; pods lomentaceous, softly pubescent to glabrate, usually straight, or only slightly recurved, divaricate, 4–7 cm. long.

Distribution: Wyoming and Colorado.

CITATION OF SPECIMENS:

WYOMING: rocky bars near Little Laramie River, Albany Co., June 15, 1901, *Goodding 10* (MBG); stream bank near Centennial, Albany Co., June 24, 1929, *Goodman 632* (MBG); Telephone Canyon, Pole Creek, Medicine Bow Mtns., July 16, 1925, *Hanna 96* (MBG); J. Johnson's ranch, Aug. 8, 1897, *Nelson 3903* (WYO, TYPE); along banks, Sand Creek, Albany Co., June 2, 1900, *Nelson 7031* (MBG); creek banks, Mandel, Albany Co., July 24, 1903, *Nelson 1910* (MBG); edge of thickets, Fish Creek, Albany Co., July 4, 1917, *Nelson 9784* (MBG); moist creek bottom, Crow Creek, Laramie Hills, Albany Co., July 11, 1935, *Rollins 977* (MBG); dry hillside among sage-brush near Crow Creek, Laramie Mtns., Albany Co., June 20, 1935, *Williams 2236* (MBG).

COLORADO: Breckenridge, Rocky Mtns., 1871, *Brandege 279* (MBG); Brookvale, Clear Creek Co., June 11, 1918, *Churchill* (MBG); Ward, July 7, 1906, *Daniels 109* (MBG); Clear Creek Valley, Idaho Springs, Aug. 2, 1874, *Engelmann* (MBG); slopes, Anita Peak, Routt Co., Aug. 3, 1903, *Goodding 1779* (MBG); common 10 mi. west of Boulder on dry slopes near Boulder Falls, July 5, 1920, *Hanson c375* (MBG); Boulder, Aug. 21, 1884, *Letterman* (MBG); near Breckenridge, Summit Co., Aug. 1901, *Mackenzie 256* (MBG); near houses, Wagon Wheel Gap Exp. Sta-

tion, Mineral Co., June 3, 1900, *Murdoch 4524* (MBG); moist mountain meadows, Trails' End, Aug. 26, 1923, *Nelson 10019* (MBG); wet creek banks, Salida, May 18, 1925, *Nelson 10495* (MBG); stream banks, Idaho Springs, Sept. 3, 1928, *Nelson 10948* (MBG); dry slopes, Tolland, July 4, 1923, *Overholts, Roberts & Shope 140* (MBG); Idaho Springs, July 20, 1884, *Smith* (ANSP); Lyons, May 23, 1892, *Smith* (MBG); Manitou Park, July 7, 1891, *Trelease* (MBG); Golden, June 30, 1933, *Zobel* (MBG).

**8. *T. pinetorum* Greene, *Pittonia* 4: 138. 1900.**

*T. pauciflora* Thornber ined.

Plant 3-4 dm. high, sparsely pubescent to glabrate; stem slender, firm, branched; stipules broadly lanceolate, 1.5-3.5 cm. long, lowermost frequently longer than the leaflets; petioles 1.5-3 cm. long; leaflets broadly oblanceolate to elliptic, glabrous above, sparsely appressed-pubescent below, 4-5 cm. long, 1.5-3 cm. broad; racemes loose, few-flowered, usually less than 1 dm. long; bracts ovate-cordate, semi-persistent; pedicels 5-10 mm. long; calyx silky-villous; pods straight, ascending, glabrate, 4-6 cm. long.

Distribution: Colorado to New Mexico, Utah, and Arizona.

CITATION OF SPECIMENS:

COLORADO: Flat Top Mtn., Estes Park, Aug. 14, 1933, *Allen 3* (MBG); Larimer Co., May 10, 1895, *Baker* (MBG); Los Pinos (Bayfield), May 23, 1899, *Baker 442* (fl.) (MBG, WYO, part of TYPE, CAL, ND); Marshall Pass, July 19, 1901, *Baker 485* (fr.) (MBG, FM, WYO, CAL, ND, part of TYPE); Chicken Creek, La Plata Mtns., July 6, 1898, *Baker, Earle & Tracy 350* (MBG); dry soil, Mount Vernon Cañon, Jefferson Co., June 20, 1921, *Bethel & Clokey 4186* (MBG); Estes Park, Aug. 14, 1933, *Burton* (MBG); meadow, Fremont Ranger Station, Rio Grande Nat. Forest, Mineral Co., May 27, 1911, *Murdoch 4519* (MBG); dry hillsides, Tolland, June 25, 1913, *Overholts* (MBG); Ward, 1908, *Pace 296* (MBG); aspen groves, Uncompahgre Divide, W. Montrose Co., July 3, 1924, *Payson & Payson 3398* (MBG); Denver, May 23, 1892, *Smith* (MBG).

NEW MEXICO: Solitario, vicinity of Las Vegas, July 9, 1926, *Arséne 17863* (MBG); canyon, vicinity of Santa Fe, July 31, 1926, *Arséne & Benedict 16925* (MBG); Balsam Park, Sandia Mtns., May-June 1915, *Ellis 40* (MBG); base of mountains in Santa Fe Creek Valley 5 mi. above town, May 1847, *Fendler 185* (MBG); along Pecos River 8 mi. east of Glorietta, San Miguel Co., June 9, 1897, *Heller & Heller 3681* (MBG); in Mogollon Mtns. near west fork of Gila River, Socorro Co., Aug. 23, 1903, *Metcalf 593* (MBG).

ARIZONA: Chiricahua Mtns., Barfoot Park, north slope, Aug. 19, 1907, *Blumer 1590* (MBG); Matzatzal Mtns., Gila Co., *Collom 286* (MBG); Chiricahua Mtns., Rustlers' Park, June 18-19, 1930, *Goodman & Hitchcock 1162* (MBG); yellow pines, Flagstaff, Aug. 4, 1922, *Hanson 481* (MBG); Baker's Butte, June 2, 1890, *Jones* (MBG); Flagstaff, June 1883, *Rusby 551* (MBG); stony creek banks, Flagstaff, April 21, 1925, *Nelson 10200* (MBG); Oak Creek Canyon, May 24, 1935, *Nelson & Nelson 2108* (MBG).

UTAH: gravel, Silver Reef, May 4, 1894, *Jones 5158* (MBG); Elk Ridge, west ridge, San Juan Co., June 23, 1932, *Maguire & Redd 1918* (MBG); near timberline, La Sal Mtns., Grand Co., July 22, 1924, *Payson & Payson 3957* (MBG); moist shaded locations in canyon, Geyser Basin, San Juan Co., July 19, 1912, *Walker 315* (MBG).

9. *T. montana* Nutt. ex Torr. & Gray, Fl. N. Am. 1: 388. 1840.

*T. fabacea* (Pall.) DC. ex Hooker, Fl. Bor. Am. 1: 128. 1838.

*T. angustata* Greene, Pl. Baker. 3: 34. 1901.

*T. stricta* Greene, Pl. Baker. 3: 34. 1901.

Plant 6–8 dm. high, slightly villous to glabrate in parts; stem stout, succulent, sparingly branched, branches ascending; stipules linear-lanceolate, ascending, 2–3 cm. long; petioles 1–3 cm. long; leaves ascending, leaflets linear to linear-lanceolate, converging, 3–8 cm. long; racemes compact, erect, 1–2 dm. long, bracts lanceolate, 0.8–1.2 cm. long, semi-persistent; pedicels 4–6 mm. long; calyx-tube silky villous; pods villous, straight, erect, closely appressed to rachis, 5–7 cm. long.

Distribution: Montana south to Colorado, west to Oregon and Nevada.

#### CITATION OF SPECIMENS:

MONTANA: frequent, low ground, Bozeman, June 28, 1899, *Blankinship* (MBG); low ground, Belgrade, June 2, 1906, *Blankinship 681* (MBG); Sheridan, June 1895, *Fitch* (MBG); East Gallatin Swamps, July 24, 1896, *Flodman 614* (MBG); meadow, Armsted, Beaverhead Co., June 20, 1920, *Payson & Payson 1734* (MBG).

WYOMING: river bottoms, Henry's Fork, Uintah Mtns., June 26, 1902, *Goodding 1192* (MBG); meadows, Slater, Colo.-Wyo. line, Carbon Co., July 31, 1903, *Goodding 1733* (MBG); moist, grassy bottom-land along Ham's Fork, Granger, June 11, 1931, *Hanna 735* (MBG); moist peat in meadow of grasses and sedges, Lonetree, Uintah Co., June 21, 1934, *Harrison & Larsen 7915* (MBG); moist grassy places, Fort Bridger, June 27, 1926, *Heller 13949* (MBG); among willows and cottonwoods, Evanston, Uintah Co., June 14, 1900, *Nelson 7216* (MBG); wet river lands, Baggs, July 4, 1926, *Nelson 10720* (MBG); Laramie, June 28, 1899, *Pammel 57* (MBG); in wet swales, hills east of Lyman, June 8, 1932, *Rollins 147* (MBG).

COLORADO: Fort Collins, May 15, 1896, *Baker* (MBG); Sapinero, June 19, 1901, *Baker 173* (fl.) (MBG, WYO, CAL, ND, part of TYPE of *T. stricta* Greene); Gunnison, July 24, 1901, *Baker 604* (fr.) (MBG, WYO, CAL, ND, part of TYPE of *T. stricta* Greene); clearing, Everett Lake, Lake Co., July 5, 1919, *Clokey 3588* (MBG); no definite locality, 1871, *Greene* (MBG); low wet grassy banks of White River, 2 mi. east of Meeker, Rio Blanco Co., Aug. 18, 1935, *Maguire & Piranian 12844* (MBG); rocky mountain slopes between Corona Station and Tolland, Gilpin Co., June 24, 1926, *Palmer 31258* (MBG); river bottom, Naturita, May 20, 1914, *Payson 330* (MBG); Canyon City, 1888, *Wislizenus 843* (MBG).

IDAHO: Bear Lake, Aug. 8, 1898, *Mulford 280* (MBG); wet sandy banks, Devil Creek, Owyhee Co., June 27, 1912, *Nelson & Macbride 1742* (MBG).

UTAH: Kimballs, vicinity of Salt Lake City, June 3, 1908, *Clemens* (MBG); north slope of Abajo Mtns., July 1-2, 1930, *Goodman & Hitchcock 1389* (MBG); damp meadow near Bear River, Summit Co., Aug. 10, 1931, *Greenman & Greenman 4620* (MBG); Fish Lake, Aug. 10, 1927, *Harris c27572* (MBG); deep shade of aspen grove, Ashley Forest, Duchesne Co., June 13, 1934, *Harrison & Larsen 7623* (MBG); dry rocky hillside, Carter Creek, Daggett Co., June 19, 1934, *Harrison & Larsen 7883* (MBG); grassy bank of Sheep Creek at Manila Rd., Daggett Co., July 11, 1933, *Hermann 4728* (MBG); edge of aspens in wet meadow, Goodman ranch, Bear River Valley, Summit Co., Aug. 9, 1933, *Hermann 5764* (MBG); Heyrum, May 15, 1898, *Mulford 44* (MBG); in woods, shady banks of Bear River, Uintah Mtns., July 26-Aug. 7, 1902, *Pammel & Blackwood 4113* (MBG); Fish Lake, July 9, 1875, *Ward 344* (MBG); Sheep Creek Canyon, vicinity of Flaming Gorge, Daggett Co., May 29, 1932, *Williams 432* (MBG).

NEVADA: vicinity of Current, Nye Co., May 1916, *Bentley* (MBG); Star Valley, foothills of Ruby Mtns., July 20, 1896, *Greene* (ND, TYPE of *T. angustata* Greene); Star Canyon southeast of Deeth, Elko Co., July 10, 1912, *Heller 10575* (MBG); Wells, June 22, 1930, *Jones 25461* (MBG); Eureka, Eureka Co., July 2, 1904, *Kennedy 338* (MBG); North Fork, Humboldt River, Elko Co., Aug. 6, 1913, *Kennedy 4474* (MBG); sandy river banks, Mountain City, Aug. 13, 1912, *Nelson & Macbride 2200* (MBG); Camp Hallick, 1876, *Palmer* (MBG).

OREGON: moist sunny bottoms of South Fork, John Day, Prairie City, Grant Co., June 5 & 17, 1925, *Henderson 5384* (MBG); Canyon City, May 20, 1885, *Howell* (MBG); dry woods, summit of Blue Mtns., near Meacham, Umatilla Co., May 10, 1928, *Gale 254* (MBG).

EXACT LOCALITY UNKNOWN: Rocky Mountains, *Nuttall* (ANSP, TYPE).

10. *T. ovata* (Rob.) Rydb. in Bull. Torr. Bot. Club 40: 43. 1913.

*T. montana* subsp. *ovata* Rob. in Contr. U. S. Nat. Herb. 2: 349. 1906.

*T. xylorrhiza* Nels. in Bot. Gaz. 52: 265. 1911.

Plant 6-8 dm. high, softly pubescent to glabrate throughout; stem stout, succulent, sparingly branched; stipules foliaceous, obovate to ovate-cordate, 2-4 cm. long; petioles 2-4 cm. long; leaflets obovate to broadly elliptic, 6-8 cm. long, 2-4 cm. broad; racemes loose, 2-3.5 dm. long; bracts foliaceous, ovate-cordate, 1-1.5 cm. long; calyx-tube villous; pods silky-villous, ascending, usually but not always closely appressed to the rachis, 5-7 cm. long.

Distribution: Wyoming west to Washington, and Oregon.

CITATION OF SPECIMENS:

WYOMING: Evanston, July 28, 1897, *Nelson 3863* (MBG).

IDAHO: forest, Nez Perces Co., Aug. 1896, *Brown* (MBG); grassy ditch, arid transition  $\frac{1}{2}$  mi. southeast of Lapwai, Nez Perces Co., May 3, 1935, *Constance, Clark, Dillon, Machlis & Rollins* (MBG); sandy bank of Middle Fork Clearwater River, at mouth of Squaw Creek, 3 mi. below Lowell, Canadian Zone, Nez Perces National Forest, Idaho Co., May 30, 1936, *Constance & Rollins 1621* (MBG); Latah Co., 1896, *Elmer 363* (MBG); Cedar Mtns., Latah Co., July 1899, *Elmer 1535* (MBG); near Lewiston, Nez Perces Co., May 7, 1896, *Heller & Heller 3035* (MBG); Indian Valley, July 13, 1899, *Jones 6222* (MBG); shady loam slopes, Falks' Store, Canyon Co., May 24, 1910, *Macbride 99* (MBG, WYO, CAL, TYPE of *T. xylorrhiza* Nels.); moist loamy flats, Falks' Store, Canyon Co., May 10, 1911, *Macbride 800* (MBG); natural meadow lands, Squaw Creek (Sweet), May 9, 1911, *Macbride 845* (MBG); Latah Co., June 16, 1893 (June 21, 1894), *Piper 1489* (MBG, FM, TYPE); sandy shores, valley of Hatwai Creek, Nez Perces Co., April 28, 1892, *Sandberg, MacDougal & Heller 68* (MBG).

WASHINGTON: light shade of lodgepole forest 4 mi. north of Table Rock, Blue Mtns., Columbia Co., July 20, 1935, *Constance, Clarke, Staats & Van Fleet* (MBG); Oxford Prairie, Chehalis Co., June 12, 1897, *Lamb 1197* (MBG, ANSP, FM, CAL); roadsides north of Hoquiam, Grays Harbor Co., May 9, 1931, *Thompson 6238* (MBG); roadside near Humptulips, Grays Harbor Co., July 10, 1931, *Thompson 7342* (MBG).

OREGON: moist situations, eastern Ore., June 24, 1899, *Cusick 2203* (MBG); Summit, June 1, 1892, *Mulford* (MBG); open woods near summit of Blue Mtn., between Pendleton and La Grande, June 14, 1928, *Thompson 4723* (MBG); damp field south of Imbler, Union Co., June 15, 1928, *Thompson 4830a* (MBG); wooded slopes of Sexton Mtn., Josephine Co., April 9, 1934, *Thompson 10209* (MBG).

11. *T. macrophylla* Hook. & Arn. Bot. Beech. Voy. 329. 1840; Torr. & Gray, Fl. N. Am. 1: 388. 1840; Torr. in Pac. Rail. Rept. 4: 81. 1856.

*T. fabacea* (Pall.) DC. ex Torr. Bot. Mex. Bound. Surv. 58. 1856.

*T. californica* S. Wats. in Proc. Am. Acad. 11: 126. 1876.

*T. robusta* Howell in Erythea 1: 109. 1893.

Plant 4-6 dm. high, woolly-tomentose throughout; stem stout, diffusely branched, branches ascending; stipules foliaceous, ovate-cordate, 2-3.5 cm. long; petioles 1.5-2.5 cm. long; leaflets obovate-cuneate to oblanceolate or occasionally elliptic, 4-7 cm. long, 3-4 cm. broad; racemes loose or compact, straight, erect, 1.5-2.5 dm. long; bracts ovate-cordate, 0.5-1 cm. long, semi-persistent; pedicels 4-6 mm. long; calyx appressed-pubescent; pods densely appressed-pubescent, erect, 6-8 cm. long.

Distribution: Oregon and upper California.



## CITATION OF SPECIMENS:

OREGON: Coast Mtns., Curry Co., June 1884, *Howell 75* (GH); Coast Mtns., 40th parallel, June 8, 1884, *Howell* (FM).

CALIFORNIA: in moist grassy places in open hills, Crystal Springs Lake, San Mateo Co., May 1, 1902, *Baker 685* (MBG); Knoxville, Napa Co., May 8, 1903, *Baker 3081* (MBG); Pac. R.R. Exp., 1853-4, *Bigelow* (ANSP); dry hillsides, Coast Range, San Rafael, May 1865, *Bolander* (MBG); near Mendocino, Mendocino Co., May 1898, *Brown 732* (MBG); no definite locality, *Douglas* (GH, probable TYPE); Tassajara Hot Springs, Monterey Co., June 1901, *Elmer 3289* (MBG); Mount Hamilton, Santa Clara Co., June 1903, *Elmer 5023* (MBG); Marin Co., April 4, 1921, *Epling 5233* (MBG); no definite locality, 1846, *Fremont 149* (MBG); Lagunitas, Marin Co., April 28, 1918, *Grinnell* (MBG); Smith Creek, foot of Mt. Hamilton, Santa Clara Co., May 10, 1907, *Heller 8518* (MBG, ANSP, FM); damp soil in ditch along highway about 5 mi. south of Calistoga, Napa Co., April 12, 1924, *Heller 13537* (MBG); between Santa Rosa and Agua Caliente, Sonoma Co., April 22, 1902, *Heller & Brown 5343* (MBG); Mt. Tamalpais, April 10, 1906, *Hobson* (MBG); Napa Co., Mar. 1852, *Thurber 548* (MBG, FM); San Luis Obispo, May 9, 1882, *Jones 2660* (MBG).

12. *T. macrophylla* var. *velutina* (Greene) Larisey, comb.

nov.

*T. californica* var. *velutina* Greene in *Erythea* 1: 81. 1893.

*T. velutina* Greene in *Erythea* 3: 19. 1895.

*T. gracilis* var. *velutina* Jepson, Man. Fl. Pl. Calif. 515. 1925.

As the species except somewhat stouter though smaller throughout, and with a more silvery-silky appressed pubescence.

Distribution: California.

## CITATION OF SPECIMENS:

CALIFORNIA: open flat 1 mi. south of Lagunitas, April 20, 1930, *Bracelin 10* (MBG); Crystal Springs Lake, San Mateo Co., May 1903, *Elmer 4824* (MBG); Mount Hamilton, July 1891, *Greene 32762 & 3* (MBG, ND, TYPE of *T. velutina* Greene); Mount Hamilton, Santa Clara Co., May 31, 1907, *Heller 8606* (MBG, ANSP, FM); mountains, San Diego, Aug. 1879, *Orcutt 594* (MBG); Santa Cruz Mtns., 1888, *Parry* (MBG); warm slope, Cuyamaca Lake area, San Diego Co., May 18, 1935, *Purser 6616* (MBG).

13. *T. gracilis* Howell in *Erythea* 1: 109. 1893.

Plant 4-8 dm. high, sparingly strigose throughout; stem erect, slender, branches spreading; stipules broadly ovate-cordate to lanceolate, 1-2 cm. long; petioles 2-3 cm. long; leaflets obovate to oblanceolate, 3.5-5.5 cm. long, 2-3 cm. broad; racemes loose, 1-1.5 dm. long; bracts broadly ovate, 0.7-1.2 cm.



long, semi-persistent; pedicels 0.5–1 cm. long; calyx silky villous; pods densely villous, recurved, divaricate, lomentaceous, 4–5 cm. long.

Distribution: Oregon.

CITATION OF SPECIMENS:

OREGON: summit of lower Siskiyou Mtns., July 3, 1902, *Cusick 2927* (MBG); Corvallis, May 1922, *Epling 5615* (MBG); Waldo, April 1892, *Howell* (CAL); Waldo, July 1894, *Howell 1495* (MBG, ANSP, CAL).

**14. *T. gracilis* var. *argentata*** (Greene) Jeps. Fl. Pl. Calif. 515. 1893.

*T. argentata* Greene in *Erythea* 3: 18. 1899.

As the species except silvery-canescens throughout, and having somewhat longer stipules.

Distribution: California.

CITATION OF SPECIMENS:

CALIFORNIA: Modoc Co., 1893, *Baker* (ND, TYPE of *T. argentata* Greene); Forestdale, Modoc Co., Aug. 14, 1899, *Baker* (MBG, ANSP, WYO, CAL); near Egg Lake, Modoc Co., Aug. 1894, *Baker & Nutting* (CAL, WYO).

**15. *T. gracilis* var. *venosa*** (Eastw.) Jeps. Man. Fl. Pl. Calif. 515. 1925.

*T. venosa* Eastw. in Bull. Torr. Bot. Club 32: 198. 1905.

As the species except glabrous and somewhat more delicate throughout, stipules more foliaceous, and leaflets more conspicuously veined.

Distribution: Oregon and California.

CITATION OF SPECIMENS:

OREGON: Grave Creek, May 14, 1889, *Hammond 74* (MBG); open woods on trail to Tennessee Pass 2 mi. from Kirby, April 20, 1926, *Henderson 5981* (MBG).

CALIFORNIA: Dunsmuir, Siskiyou Co., July 23, 1912, *Eastwood 1319* (MBG); Shasta Springs on road to McCloud, May 27, 1923, *Eastwood 11865* (MBG); between Lamoine & Williams ranch on state highway in yellow pine and oak belt, Shasta Co., June 19, 1919, *Heller 13250* (MBG); McCloud Fork, Shasta Co., April 24, 1913, *Smith 110* (MBG).

#### DOUBTFUL SPECIES

*T. subglabra* Henderson in *Rhodora* 32: 26. 1930.

The type specimen of this species was not available; from the description it appears to be *T. gracilis* var. *venosa*.

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